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Stability of Parts-Per-Billion Hazardous Organic Cylinder Gases and Performance Audit Results of Source Test and Ambient Air Measurement Systems. Status Report 3

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15. SUPPLEMENTARY NOTES An evaluation of 27 gaseous organic compounds at parts-per-billion (ppb) levels in compressed gas cylinders has been conducted by the U.S. Environmental Protection Agency (EPA). The pr[illegible] objectives of this on-going project are: 1) to

16. ABSTRACT

evaluate the quality [illegible] measurements made by USEPA, state/local agencies or their contractors by using ppb cylinders for performance audits to assess the relative accuracy of source measurement systems during hazardous waste trial burn tests and ambient air monitoring programs; 2) to verify the manufacturer's certified analysis of the multi-component gas mixtures; 3) to determine the stability of gas mixtures with time; and 4) to develop new audit materials as requested by EPA. The cylinders consist of 4 mixtures of 5, 6, 7 and 9 organic compounds each. These mixtures were blended by a commercial gas supplier in aluminum cylinders in a balance gas of nitrogen. The 5-component mixture (Group I) contains carbon tetrachloride, chloroform, perchloroethylene, vinyl chloride and benzene. The 9-component mixture (Group II) includes trichloroethylene, 1,2-dichloroethane, 1,2dibromoethane, acetonitrile, trichlorofluoromethane (F-11), dichlorodifluoromethane (F-12), bromomethane, methyl ethyl ketone and 1,1,1-trichloroethane. The 7-component mixture (Group III) includes vinylidene chloride, 1,1,2-trichloro 1,2,2-tricluoroethane (F-113), 1,2-dichloro 1,1,2,2-tetrafluoroethane (F-114), acetone, 1,4-dioxane, toluene, and chlorobenzene. The 6-component mixture (Group IV) includes acrylonitrile, 1,3butadiene, ethylene oxide, methylene chloride, propylene oxide and o-xylene. To date, 95 performance audits have been initiated and 76 are complete. The results of these audits and description of the experimental procedures used for analyses and available stability data are presented in this Status Report #3.

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STABILITY OF PARTS-PER-BILLION HAZARDOUS ORGANIC CYLINDER GASES AND PERFORMANCE AUDIT RESULTS OF SOURCE TEST AND AMBIENT AIR MEASUREMENT SYSTEMS

STATUS REPORT #3

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NOTICE

This document has been reviewed in accordance with U.S. Environmental Protection Agency policy and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

Source measurement and monitoring efforts are designed to anticipate potential environmental problems, to support regulatory actions by developing data bases needed in developing regulations and to provide means of monitoring compliance with regulations. The Environmental Monitoring Systems Laboratory, Research Triangle Park, North Carolina, has the responsibility for implementation of agency-wide Quality Assurance programs for air pollution measurement systems; and supplying technical support to other groups in the Agency including the Office of Air and Radiation, the Office of Toxic Substances, and the Office of Enforcement.

The need for reliable standards for auditing and documenting the accuracy of source emission measurement of organic hazardous pollutants is well established. The Quality Assurance Division of EPA's Environmental Monitoring Systems Laboratory has responded to this need through the development of compressed gas cylinders containing gaseous organic compounds in parts-per-billion (ppb) levels. The primary objectives of this on-going project are (1) to evaluate the quality of measurements made by EPA, state/local agencies, or their contractors, by using ppb gas cylinders for performance audits during hazardous waste trial burn tests and ambient air monitoring programs; (2) to verify the manufacturer's certified analysis of the multi-component gas mixtures, (3) to determine the stability of the gas mixtures with time, and (4) to develop new audit materials as requested by EPA. This report describes the current status of this project. Included in the report are (1) a description of the experimental procedures used for the analyses of multi-component ppb level gas mixtures; (2) a description of the audit procedure, and (3) currently available audit results and stability data.

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ABSTRACT

An evaluation of 27 gaseous organic compounds at parts-per-billion (ppb) levels in compressed gas cylinders has been conducted under a contract with the U.S. Environmental Protection Agency (USEPA). The primary objectives of this on-going project are: (1) to evaluate the quality of measurements made by USEPA, state/local agencies, or their contractors by using ppb gas cylinders for performance audits during hazardous waste trial burn tests and ambient air monitoring programs; (2) to verify the manufacturer's certified analyses of the multi-component gas mixtures; (3) to determine the stability of the gas mixtures with time; and (4) to develop new audit materials as requested by USEPA.

The cylinders consists of four mixtures of five, six, eight and nine organic compounds each. These mixtures were blended by a commercial gas supplier in aluminum cylinders in a balance gas of nitrogen. The five-component mixture (Group I) contains carbon tetrachloride, chloroform, tetrachloroethylene, (perchloroethylene), vinyl chloride and benzene. The nine-component mixture (Group II) includes trichloroethylene, 1,2-dichloroethane (ethylene dichloride), 1,2-dibromoethane (ethylene dibromide), acetonitrile, trichlorofluoromethane (F-11), dichlorodifluoromethane (F-12), bromomethane (methyl bromide), methyl ethyl ketone and 1,1,1-trichloroethane. The eight-component mixture (Group III) includes pyridine*, vinylidene chloride, 1,1,2-trichloro-1,2,2-trifluoroethane (F-113), 1,2-dichloro-1,1,2,2-tetrafluoroethane (F-114), acetone, 1,4-dioxane, toluene, and chlorobenzene. The six-component mixture (Group IV) includes acrylonitrile, 1,3-butadiene, ethylene oxide, methylene chloride, propylene oxide, and o-xylene. To date 95 performance audits have been initiated and 76 are complete. The results of these audits and a description of the experimental procedures used for analyses and available stability data are presented in this status report. Generally, the results of the audits show reasonable agreement (plus or minus 50 percent) with the audit material concentrations measured by Research Triangle Institute (RTI), considering the low concentrations of the organics and the anticipated uncertainty associated with independent analyses conducted by an audit laboratory.

*Although Group III cylinders contain pyridine, the concentrations are not certified due to severe analytical difficulties.

Stability studies for all Group I, Group II, and Group III compounds have been performed. Results have established that all the compounds tested are suitably stable for use as reliable audit materials. The Group IV compounds will not be available for audits until the stabilities of the compounds have established. If the data indicate that the Group IV compounds are stable, Group IV mixtures should be available for audits on or after December 30, 1986.

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SECTION 1
INTRODUCTION

OBJECTIVES

The application of Quality Assurance practices is important to the generation of high-quality environmental data. The Quality Assurance Division of USEPA's Environmental Monitoring Systems Laboratory has initiated a program to supply audit materials for use during hazardous waste trial burn tests and ambient air measurements. RTI in contract with USEPA, has responded to this need through development of gas cylinders containing 27 gaseous organic compounds at ppb levels. The main objectives of this project are: (1) to evaluate the quality of measurements made by USEPA, state/-local agencies, or their contractors, by using ppb gas cylinders for performance audits to assess the relative accuracy of source measurement systems during hazardous waste trial burn tests and ambient air monitoring programs; (2) to verify the manufacturer's certified analysis of the multi-component gas mixtures; (3) to determine the stability of the gas mixtures over time; and (4) to develop new audit materials as requested by USEPA.

This report describes the current status of the project. Included in the report are: (1) a description of the experimental procedures used for the analyses of multi-component ppb level gas mixtures; (2) a description of the audit procedure; and (3) currently available audit results and stability data.

AUDIT MATERIALS CURRENTLY AVAILABLE

The audit materials currently contain 27 compounds selected on the basis of the anticipated needs of USEPA's Office of Solid Waste. Table 1 lists the compounds, the concentration ranges, and the number of cylinders in each group. Group I cylinders each contain five (5) compounds; Group II cylinders each contain nine (9) compounds; Group III cylinders each contain eight (8) compounds; and Group IV cylinders each contain six (6) compounds. The audit cylinders fall into either two or three concentration ranges, depending upon the group to which the cylinder belongs. Each compound in the low concentration range is between 7 and 90 ppb and in the intermediate concentration range each compound is between 90 and 430 ppb. In addition, Group I and Group IV cylinders are available in a high concentration range between 430 and 10,000 ppb. The balance gas for all gas mixtures is nitrogen, and the cylinder construction material is aluminum.

Table 1. PPB Level Organic Gases Currently Available

Group	No. of Cylinders	Concentration Range of Each Compound (ppb)
Group I*	20	7-90
	12	90-430
	12	430-10,000
Group II**	12	7-90
	6	90-430
Group III***	9	7-90
	3	90-200
Group IV****	12	7-90
	6	430-10,000

*Group I Compounds: Carbon tetrachloride, chloroform, tetrachloroethylene and benzene.

**Group II Compounds: Trichloroethylene, 1,2-dichloroethane, 1,2-dibromoethane, acetonitrile, trichlorofluoromethane (F-11), dichlorodifluoromethane (F-12), bromomethane, methyl ethyl ketone, and 1,1,1-trichloroethane.

***Group III Compounds: Pyridine, Vinylidene Chloride, 1,1,2-trichloro-1,2,2-trifluoroethane (F-113), 1,2-dichloro-1,1,2,2-tetrafluoroethane (F-114), acetone, 1,4-dioxane, toluene, and chlorobenzene.

****Group IV Compounds: Acrylonitrile, 1,3-butadiene, ethylene oxide, methylene chloride, propylene oxide, and o-xylene. These cylinders should be available for performance audits on or after December 30, 1986.

SECTION 2
EXPERIMENTAL PROCEDURES

Accurate analyses of the cylinder gases are required (1) to verify the concentrations reported by the specialty gas company which prepared the gas mixtures, and (2) to assess the long-term stability of the concentrations of the compounds.

INSTRUMENTATION

Analyses of Group I, II and III mixtures are performed using a Hewlett-Packard 5880A gas chromatograph equipped with flame ionization and electron capture detectors. The electron capture detector (ECD) is used principally for measurement of all the halogenated hydrocarbons except vinyl chloride. The flame ionization detector (FID) is used for the analysis of vinyl chloride, benzene, methyl ethyl ketone, acetonitrile, all Group III compounds, and all of the Group I compounds in the high concentration range cylinders. The gaseous samples are injected onto the gas chromatographic column by means of two Valco six-port gas sampling valves mounted near the injection port. One valve is equipped with interchangeable sampling loops (1 cc and 3 cc) to allow the injection of different volumes of the gas mixtures. A schematic of the gas chromatographic system is shown in Figure 1.

The gas chromatographic parameters used in the measurement of individual compounds in Group I, Group II and Group III are listed in Table 2. The gas chromatographic parameters for the Group IV compounds have not yet been established.

CALIBRATION

Calibration of the gas chromatograph involves measurement of known concentrations of organic gases in nitrogen. A custom-designed permeation system (Figure 2) which produces known concentrations of organics in nitrogen is used for calibration, except in the case of the Group III cylinders where a standard cylinder mixture developed and characterized by the National Bureau of Standards (NBS) is used for calibration with a similar NBS standard cylinder mixture used for quality control. Permeation tubes purchased

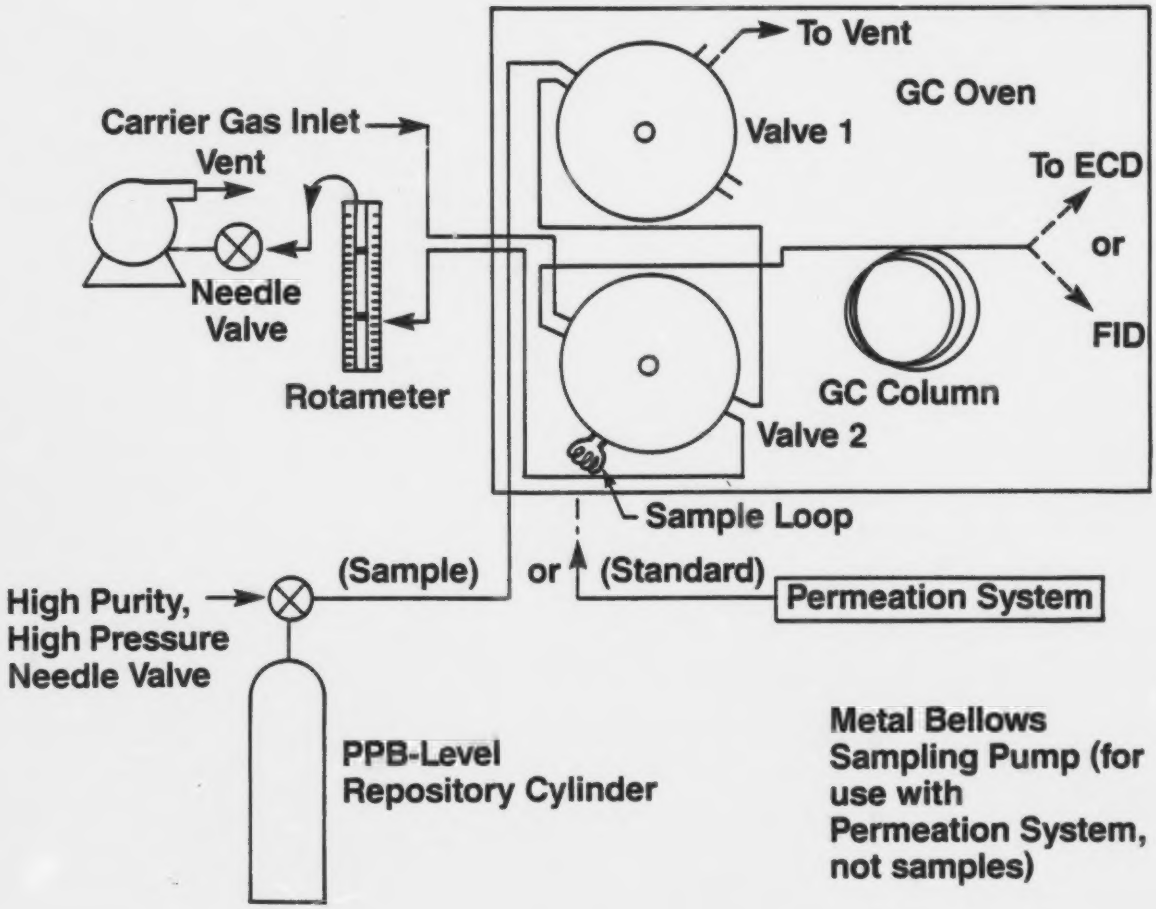
To Vent
GC Oven
Carrier Gas Inlet
Valve 1
Vent
To ECD
or
Needle Valve
FID
Rotameter
GC Column
Valve 2
Sample Loop
(Sample)
or
(Standard)
Permeation System
High Purity, High Pressure Needle Valve
PPB-Level Repository Cylinder
Metal Bellows Sampling Pump (for use with Permeation System, not samples)

Figure 1. Schematic of the Gas Chromatographic System

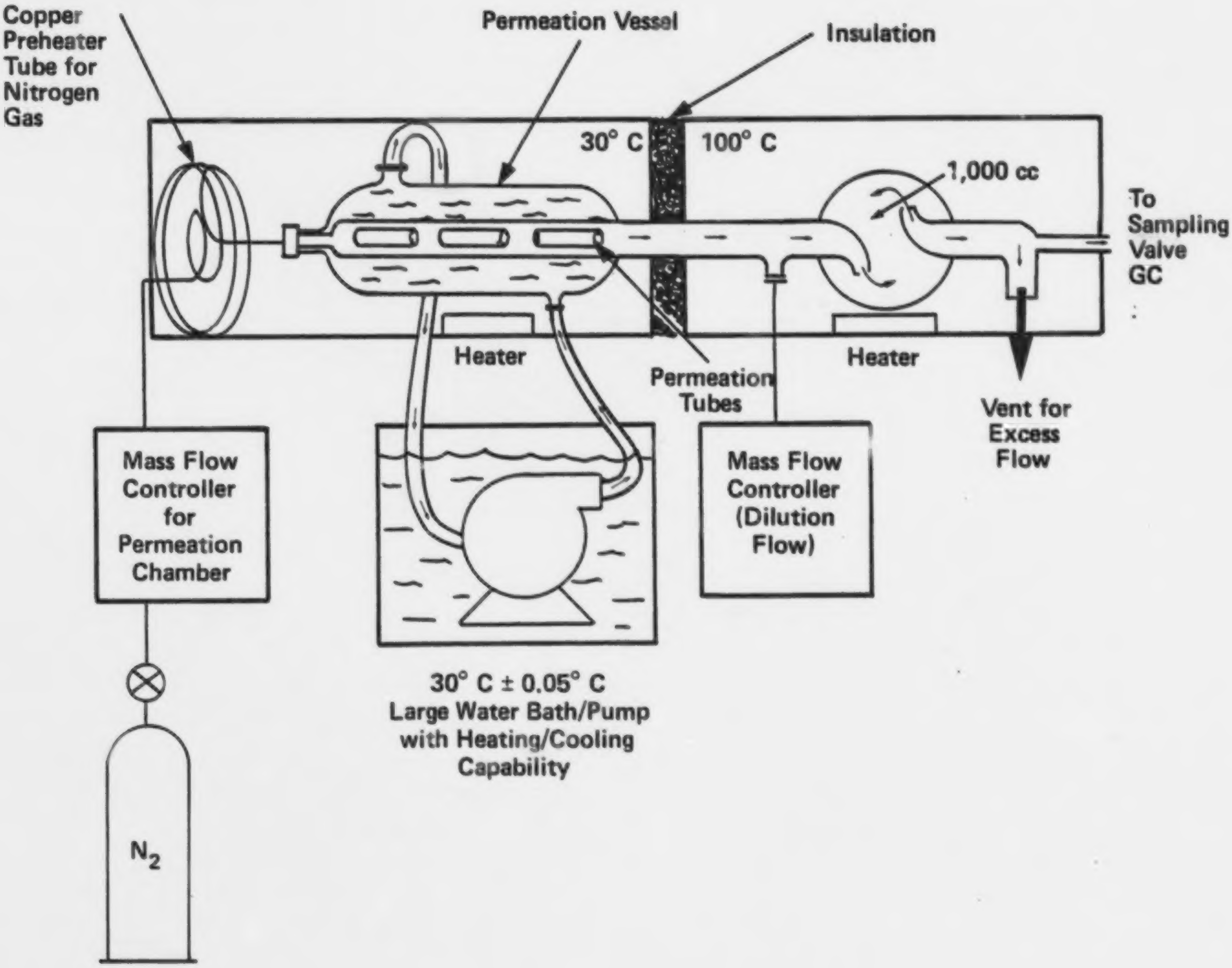
Copper Preheater Tube for Nitrogen Gas
Permeation Vessel
Insulation
30° C
100° C
1,000 cc
To Sampling Valve GC
Heater
Permeation Tubes
Heater
Vent for Excess Flow
Mass Flow Controller for Permeation Chamber
Mass Flow Controller (Dilution Flow)
30° C ± 0.05° C Large Water Bath/Pump with Heating/Cooling Capability
N_2

Figure 2. Schematic of the Permeation System

Table 2. GC Conditions for Analysis of PPB-Level Cylinder Gases

Compounds	Detector	Injector Temp.	Column Temp./ Carrier Gas	Column Type	Comments
			GROUP I		
Vinyl chloride Benzene	FID at 200°C 35 cc/min Hydrogen 500 cc/min Air	100°C	80°C, Isothermal/ Nitrogen at 55 cc/min	10 ft. x 1/8" stainless steel column packed with 20% SP 2100 w/0.1% Carbowax 1500, 100/120 mesh	3.0 cc aluminum sample loop used
Chloroform Carbon tetrachloride Perchloroethylene	*ECD at 330°C	100°C	100°C, Isothermal/ Argon w/5% Methane; at 40 cc/min	10 ft. x 1/8" stainless steel column packed with 20% SP 2100 w/0.1% Carbowax 1500, 100/120 mesh	1.0 cc sample loop used
			GROUP II		
Freon 12 Freon 11 Bromomethane Trichloroethylene 1,2-Dibromoethane 1,2-Dichloroethane 1,1,1-Trichloroethane	ECD at 330°C	100°C	80°C, Isothermal/ Argon w/5% Methane at 2 cc/min 30 cc/min make-up	60 m x 0.32 mm DB-1 Capillary Column	1.0 cc sample loop used
Acetonitrile and Methyl Ethyl Ketone	FID at 200°C 35 cc/min Hydrogen 500 cc/min Air	100°C	170°C, Isothermal/ Nitrogen at 35 cc/min	6 ft. x 1/8" stainless steel column packed with Porapak Q, 60/80 mesh	3.0 cc aluminum sample loop used; conditioned the column 1 day
			GROUP III		
Freon 114 Freon 113 Vinylidiene Chloride Acetone Toluene 1,4-Dioxane Chlorobenzene	FID at 200°C 35 cc/min Hydrogen 500 cc/min Air	150°C	120°C, Isothermal/ Nitrogen 40 cc/min	20 ft. x 1/8" stainless steel column packed with 10% SP-1000, 80/100 Supelcoport	3.0 cc aluminum sample loop used

*The ECD was necessary only for low concentration level cylinders. For intermediate and high level cylinders, FID at the stated conditions was used.

from commercial suppliers are generally used as calibration standards unless otherwise specified. Generally, two to five permeation tubes at a time are placed in a temperature-controlled chamber (30.0 ± 0.1°C or 50.0 ± 0.1°C) and pure nitrogen is passed over the permeation tube at a known flow rate using Tylan mass flow controllers. The temperature at which the tubes are maintained determines the permeation rate for each tube. Permeation tubes maintained at 50°C, which are used as calibration standards for high concentration range Group I compounds, have a higher permeation rate than permeation tubes maintained at 30°C. The resultant gaseous mixture is further diluted, if necessary, by addition of nitrogen to the mixing chamber. The final gas mixture is removed from the permeation system (via a 1/16 inch stainless steel line) by a metal bellows pump located downstream from the sampling loop. Cross-contamination of the tubes does not occur as long as a chamber flow of approximately 150 cc/min or more is maintained.

The permeation rate of each permeation tube is determined every 30 to 90 days by weight-loss determination of each tube. Permeation rates are checked both before and after analysis and the average of the last three values is used for rate determination. The permeation rate data obtained for each compound are included in Appendix C. Clean nylon gloves and tweezers are used to handle the permeation tubes. The permeation tubes are removed from the permeation chamber one at a time for weighing to avoid pickup of moisture.

In order to avoid calibration errors associated with non-linear detectors (for example, ECD), at least two calibration standards are prepared each time a sample is analyzed. Both standards are prepared usually within 20 percent of the expected sample concentration. For analysis using FID, standard concentrations are matched to sample concentrations to within a factor of at least 2 and are within 20 percent at concentrations below 70 ppb. Two to six calibration standards are analyzed each day of sample analysis. To check for instrumental drift, the calibration standards are injected both at the beginning and end of each day.

SAMPLE ANALYSIS PROCEDURE

Figures 1 and 2 depict the entire analytical system used for the calibration and analysis of the gas mixtures. The procedures used for the sample analysis are as follows: Initially the sample loops are purged with the cylinder gas sample at approximately 27 cc/min for 2 minutes before injection. Whenever a 3 cc loop is used, it is purged with the cylinder gas for an additional two minutes before injection onto the column. The sample gas flow is controlled by slowly opening the needle valve attached to the cylinder. After purging the loop, the gas flow is shut off at the needle valve. Four seconds after a flowmeter registers zero flow through sample loop, injection is made automatically onto the column. Triplicate injections of the sample are made to determine the measurement precision. Generally, the measurement precision is within three percent.

QUALITY CONTROL PROCEDURES

Following quality control procedures, the permeation system is equilibrated before taking an aliquot for GC measurement. A set of primary standards for Group I, Group II and Group III multicomponent mixtures are analyzed each day cylinder gases are analyzed to verify the stability of the detector response. The Group I, Group II and Group III primary standards were prepared and analyzed by the National Bureau of Standards (NBS) as part of an Interagency Agreement with USEPA. NBS primary standards were not available for the first and second analyses of Group II compounds by RTI, shown in Appendix A (Stability Study). However, NBS primary standards were used for the third and all subsequent Group II stability analyses. RTI results for Group I, Group II and Group III NBS primary standards are included in Appendix A. Generally, RTI analysis results for the NBS primary standards are within 10 percent of the NBS analysis results. If results vary by more than 10 percent, a calibration error is assumed, and the permeation system and sample valves are checked for leaks under both positive and negative pressure. Leak detection fluid is used to check for leaks under positive pressure. Freon is used to check for leaks under negative pressure. This is achieved by monitoring the freon peak on the GC. Once all fittings are leak tight, recalibration of the GC is performed. Blank measurements are taken during cylinder analysis and, generally, blank measurements do not show a signal above the baseline.

SECTION 3
PERFORMANCE AUDITS

Research Triangle Institute supplies cylinder gases for audits upon request from USEPA, state or local agencies or their contractors. A contractor must be performing hazardous waste trial burn tests or ambient air measurements at the request of USEPA, a state or local agency in order to qualify for the performance audit. When a request is received, the cylinder pressures are measured and the cylinders are shipped by overland carrier. An aluminum suitcase containing a gas regulator, a heated glass manifold, and the necessary tubing and fittings to draw the cylinder gas sample into the glass manifold is also provided for drawing the audit gas through the VOST system. A schematic of this audit gas delivery system is shown in Appendix B, Figure 1. A letter is included with the audit cylinder which gives general instructions for conducting the audit (see Appendix B). Detailed instructions are shown in Appendix B for conducting an audit of VOST (Instruction No. 3) and bag measurements (Instruction No. 1) during a hazardous waste trial burn. The audit gas concentration for each compound and cylinder gas pressure are provided to the requesting agency audit coordinator. There is no charge for the audit, except for the cost of returning the audit cylinder.

To date, 95 performance audits have been initiated; 76 are complete. The sampling and analysis methods used by auditees during performance audits are summarized in Table 3. The audit results currently available are presented in Table 4. The audit results are usually within ± 50 percent of the audit concentrations measured by RTI.

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits

Audit No.	Client*	Use of Audit Material	Measurement System Audited
1A	A	VOST method evaluation	Sampling by VOST method Analysis by GC/MS
1B	A	BAG method evaluation (RCRA testing)	Sampling by BAG Analysis by GC/FID-ECD
2A	B	VOST method evaluation	Sampling by VOST method Analysis by GC/MS
2B	B	BAG method evaluation (RCRA testing)	Sampling by BAG Analysis by GC/ECD-PID
3	C	VOST method evaluation	Sampling by VOST Analysis by GC/PID-Hall Detector
4	D	VOST method evaluation	Sampling by VOST Analysis by GC/MS
5	Region V U.S. EPA	Hazardous waste incineration trial burn analysis evaluation	Sampling by VOST Analysis by GC/MS
6	Combustion Research Facility U.S. EPA	VOST method evaluation	Sampling by VOST Analysis by GC/MS
7	E	Hazardous waste incineration burn analysis evaluation	Direct analysis by GC/ECD

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
8	F	VOST method evaluation	Sampling by VOST Anlysis by GC/MS
9	Region III U.S. EPA	Ambient air measurement method evaluation	Sampling method unknown Analysis by GC/FID
10	C	Ambient air measurement method evaluation	Sampling method unknown Analysis by GC/FID
11	B	VOST method evaluation	Sampling by VOST Analysis by GC/MS
12	B	VOST method evaluation	Sampling by VOST Analysis by GC/MS
13	E	Hazardous waste incineration trial burn anaysis evaluation	Direct analysis by GC/ECD
14	E	Hazardous waste incineration trial burn analysis evaluation	Direct analysis by GC/ECD
15	Region VI U.S. EPA	Ambient air monitoring instrument checkout	Analysis by ambient hydrocarbon analyzer
16A	G	Ambient air measurement method evaluation	Analysis by cryogenic preconcentration followed by GC/FID

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
16B	G	Ambient air measurement method evaluation	Analysis by cryogenic preconcentration followed by GC/FID
17	H	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
18A	I	Ambient air measurement method evaluation	Analysis by direct injection followed by GC/ECD
18B	I	Ambient air measurement method evaluation	Method 1 sampling by Tedlar bags and Tenax-charcoal with analysis by GC/ECD Method 2 sampling by Tenax-charcoal with analysis by GC/FID
18C	I	Ambient air measurement method evaluation	Analysis by cryogenic preconcentration followed by GC/FID
19	B	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
20	J	Hazardous waste incineration trial burn	Direct analysis by MS/MS
21	K	Hazardous waste incineration trial burn	Sampling method unknown Analysis by GC/ECD or FID

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
22	L	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
23	M	Ambient air measurement method evaluation	Sampling method unknown Analysis by GC/FID/ECD/PID/Hall detectors
24	G	Ambient air measurement method evaluation	Analysis by cryogenic preconcentration followed by GC/FID
25	I	Ambient air measurement method evaluation	Sampling method unknown Analysis method unknown
26	N	Hazardous waste incineration trial burn	Sampling by glass bulb Analysis by GC/Hall detector
27A	I	Ambient air measurement method evaluation	Sampling into Tedlar bags followed by cryogenic preconcentration analysis by GC/ECD
27B	I	Ambient air measurement method evaluation	Sampling by Tedlar bags Analysis by direct injection into GC/ECD
27C	I	Ambient air measurement method evaluation	Method 1: sampling by Tedlar bags and Tenax trap with analysis by GC/FID Method 2: sampling by Tedlar bag with analysis by direct injection into GC/ECD

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
28	O	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
29	B	Hazardous waste incineration sampling method evaluation	Sampling by VOST Analysis by GC/MS
30A	P	Ambient air measurement method evaluation	Sampling method unknown Analysis by GC/ECD
30B	P	Ambient air measurement method evaluation	Sampling method unknown Analysis by GC/ECD
31	Q	Ambient air measurement method evaluation	Sampling method unknown Analysis method unknown
32	B	Hazardous waste incineration sampling method evaluation	Sampling by VOST Analysis by GC/MS
33	B	Hazardous waste incineration sampling method evaluation	Sampling by VOST Analysis by GC/MS
34	R	Ambient air measurement method evaluation	Sampling by Tenax-charcoal tubes Analysis method unknown

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
35	C	Ambient air measurement method evaluation	Sampling by Direct injection and cryotrap with Analysis by MS
36	C	Ambient air measurement method evaluation	Sampling by Direct injection and cryotrap with Analysis by MS
37	S	Hazardous waste incineration VOST method evaluation	Sampling by VOST Analysis by GC/FID
38	L	Ambient air measurement method evaluation	Direct analysis by GC/FID
39	L	Ambient air measurement method evaluation	Sampling on charcoal Analysis by GC/MS
40	T	Ambient air measurement method evaluation (hazardous waste landfill)	Sampling by Tenax loading Analysis by GC/MS
41	T	Ambient air measurement method evaluation (hazardous waste landfill)	Sampling by Tenax loading Analysis by GC/MS
42 (Lab A)	I	Ambient air measurement method evaluation	Sampling by Tedlar bags Analysis by GC/ECD/PID
42 (Lab A)	I	Ambient air measurement method evaluation	Sampling by Tedlar bags Analysis by GC/ECD/FID

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
42 (Lab B)	I	Ambient air measurement method evaluation	Sampling into Tedlar bags followed by preconcentration on Tenax-charcoal trap Analysis by GC/FID and GC/ECD
42 (Lab B)	I	Ambient air measurement method evaluation	Sampling by Tenax-charcoal trap Analysis by GC/FID and GC/ECD
42 (Lab C)	I	Ambient air measurement method evaluation	Sampling into Tedlar bags followed by cryogenic preconcentration Analysis by GC/PID
42 (Lab C)	I	Ambient air measurement method evaluation	Sampling into Tedlar bags followed by cryogenic preconcentration Analysis by GC/PID
42 (Lab D)	I	Ambient air measurement method evaluation	Sampling into Tedlar bags followed by cryogenic preconcentration Analysis by GC/ECD
42 (Lab D)	I	Ambient air measurement method evaluation	Sampling by Tedlar bags followed by cryogenic preconcentration Analysis by GC/ECD and GC/PID
43 (Lab A)	P	Ambient air measurement method evaluation	Analysis by direct injection into GC/ECD
43 (Lab A)	GG	Ambient air measurement method evaluation	Analysis by GC/ECD

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
44	U	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
45	U	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
46	V	Ambient air analysis method evaluation	Analysis by GC/MS
47	H	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
48	Region III U. S. EPA	Ambient air measurement method evaluation	Sampling by Tedlar bags Analysis by portable GC/PID
49	Region III U. S. EPA	Ambient air measurement method evaluation	Sampling by Tedlar bags Analysis by portable GC/PID
50	V	Ambient air measurement method evaluation	Analysis by cryogenic trapping followed by GC/ECD/FID
51 (Lab A)	I	Ambient air measurement at hazardous waste landfill	Sampling by Tedlar bags Analysis by GC/PID
51 (Lab B)	I	Ambient air measurement at hazardous waste landfill	Sampling by Tedlar bags Analysis by GC/PID

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
52	I	Ambient air measurement at hazardous waste landfill	Sampling by Tedlar bags Analysis by GC/PID
53	W	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
54	Region II U. S. EPA	Ambient air measurement at hazardous waste landfill	Analysis by direct injection using CI/MS/MS
55	Region II U. S. EPA	Ambient air measurement at hazardous waste landfill	Analysis by direct injection using CI/MS/MS
56	X	Ambient air analysis method evaluation	Direct analysis by portable GC/PID
57	Y	Ambient air measurement method evaluation	Sampling by Tenax cartridges Analysis by GC/FID
58	V	Ambient air analysis method evaluation	Analysis by cryogenic trapping followed by GC/FID/ECD
59	I	Ambient air measurement method evaluation at hazardous waste landfill	Direct analysis by portable GC

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
60 (Lab A)	I	Ambient air measurement at hazardous waste landfill	Sampling into Tedlar bags Analysis by GC/ECD
60 (Lab A)	I	Ambient air measurement at hazardous waste landfill	Sampling into Tedlar bag Analysis by GC/ECD
60 (Lab B)	I	Ambient air measurement at hazardous waste landfill	Sampling into Tedlar bag Analysis by GC/ECD
60 (Lab C)	I	Ambient air measurement at hazardous waste landfill	Analysis by cryogenic trapping followed by GC/PID/ECD
60 (Lab D)	I	Ambient air measurement at hazardous waste landfill	Analysis by cryogenic trapping followed by GC/ECD
61	I	Ambient air measurement at hazardous waste landfill	Direct analysis by portable GC
62	ASRL U. S. EPA	Ambient air analysis method evaluation	Direct analysis by GC/FID

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
63	JJ	Ambient air measurement at hazardous waste landfill	Direct analysis by TAGA 6000 MS/MS system
64	JJ	Ambient air measurement at hazardous waste landfill	Direct analysis by TAGA 6000 MS/MS system
65	JJ	Ambient air measurement at hazardous waste landfill	Direct analysis by TAGA 6000 MS/MS system
66	KK	Ambient air measurement at hazardous waste landfill	Direct analysis by TAGA 6000 MS/MS system
67	KK	Ambient air measurement at hazardous waste landfill	Direct analysis by TAGA 6000 MS/MS system
68	Z	Hazardous waste incineration trial burn	Sampling into Tedlar bags Analysis by GC/ECD
69	Z	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/ECD
70	AA	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
71	HH	Hazardous waste incineration (boiler)	Sampling by VOST Analysis by GC/MS
72	HH	Hazardous waste incineration (boiler)	Sampling by VOST Analysis by GC/MS
73	HH	Hazardous waste incineration (boiler)	Sampling by VOST Analysis by GC/MS
74	ASRL U. S. EPA (RTP)	Ambient air analysis method evaluation	Direct analysis by GC/FID
75	II	Ambient air measurement at hazardous waste landfill	Direct analysis by TAGA 6000 MS/MS
76	V	Ambient air analysis method evaluation	Analysis by cryogenic preconcentration followed by GC/FID/ECD
77	C	Ambient air analysis method evaluation	Analysis by cryogenic trapping followed by GC/FID
78	C	Ambient air analysis method evaluation	Analysis by cryogenic trapping followed by GC/FID

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
79	H	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
80	H	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
81	H	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
82	CC	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/MS
83	DD	Ambient air measurement method evaluation	Sampling by Tedlar bags Analysis by GC/FID
84	DD	Ambient air measurement method evaluation	Sampling by Tedlar bags Analysis by GC/FID
85	DD	Ambient air measurement method evaluation	Sampling by VOST Analysis by GC/FID
86	EE	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/ECD
87	FF	Ambient air measurement at hazardous waste land-	Direct analysis by TAGA 6000 MS/MS system
88	H	Hazardous waste incineration trial burn	Sampling by VOST Analysis by GC/ECD

(Continued)

Table 3. Summary of Sampling and Analysis Methods Used During Performance Audits (Continued)

Audit No.	Client*	Use of Audit Material	Measurement System Audited
89	Z	Hazardous waste incineration trial burn	Sampling by Tedlar bag Analysis by GC/ECD
90	Z	Hazardous waste incineration trial burn	Sampling by Tedlar bag Analysis by GC/ECD

*Whenever the auditee is known, an alphabetical letter is shown. Whenever the auditee is unknown, the name of the agency requesting the audit is shown.

Table 4. Summary of Performance Audit Results

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
1A	A	VOST method evaluation	Carbon Tetrachloride	21.0 ± 1.0	-50	E
			Chloroform	23.0 ± 1.0	0	
			Perchloroethylene	29.0 ± 2.0	+17	
			Benzene	18.0 ± 1.0	+31	
			Vinyl Chloride	31.0 ± 1.0	-50	
1B	A	BAG method evaluation (RCRA Testing)	Carbon Tetrachloride	141 ± 3.0	+60	E
			Chloroform	120 ± 3.0	+34	
			Perchloroethylene	126 ± 3.0	+31	
			Benzene	133 ± 3.0	+18	
			Vinyl Chloride	154 ± 3.0	-33	
2A	B	VOST method evaluation	Carbon Tetrachloride	21.0 ± 1.0	+27	E
			Chloroform	23.0 ± 1.0	+28	
			Perchloroethylene	29.0 ± 2.0	+34	
			Benzene	18.0 ± 1.0	+32	
			Vinyl Chloride	31.0 ± 1.0	-66	
2B	B	BAG method evaluation (RCRA Testing)	Carbon Tetrachloride	141 ± 3.0	-13	E
			Chloroform	120 ± 3.0	-16	
			Perchloroethylene	126 ± 3.0	-44	
			Benzene	133 ± 3.0	-27	
			Vinyl Chloride	154 ± 3.0	-34	
3	C	VOST method evaluation	Carbon Tetrachloride	21.0 ± 1.0	+10	E
			Chloroform	23.0 ± 1.0	+20	
			Benzene	18.0 ± 1.0	-9	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
4	D	VOST method evaluation	Carbon Tetrachloride	21.0 ± 1.0	-14	E
			Chloroform	23.0 ± 1.0	-20	
			Perchloroethylene	29.0 ± 2.0	+17	
			Benzene	18.0 ± 1.0	+6	
			Vinyl Chloride	31.0 ± 1.0	-10	
5	Region V U.S. EPA	Hazardous waste incineration trial burn analysis evaluation	Carbon Tetrachloride	11.0 ± 0.3	-31	E
			Chloroform	45.0 ± 0.9	+200	
			Vinyl Chloride	20.5 ± 0.7	+7	
6	Combustion Research Facility U.S. EPA	VOST method evaluation	Carbon Tetrachloride	9.9 ± 0.3	+22	E
			Chloroform	42.0 ± 0.9	0	
			Perchloroethylene	9.6 ± 0.2	+40	
			Benzene	20.0 ± 0.6	+3	
7	E	Hazardous waste incineration burn analysis evaluation	Carbon Tetrachloride	11.8 ± 0.4	-3	E
			Chloroform	10.5 ± 0.2	+86	
8	F	VOST method evaluation	Carbon Tetrachloride	21.0 ± 1.0	NA	F
			Chloroform	23.0 ± 1.0	NA	
			Perchloroethylene	29.0 ± 2.0	NA	
			Benzene	18.0 ± 1.0	NA	
			Vinyl Chloride	31.0 ± 1.0	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
9	Region III U.S. EPA	Ambient air measurement method evaluation	Carbon Tetrachloride	9.3 ± 0.3	NA	F
			Chloroform	40.0 ± 0.8	NA	
			Perchloroethylene	9.4 ± 0.2	NA	
			Benzene	20.0 ± 0.6	NA	
			Vinyl Chloride	19.0 ± 0.6	NA	
10	C	Ambient measurement method evaluation	Carbon Tetrachloride	323 ± 9.7	+6	E
			Chloroform	128 ± 2.7	+4	
			Perchloroethylene	119 ± 2.9	-3	
			Benzene	379 ± 12.1	-2	
			Vinyl Chloride	403 ± 12.1	-3	
11	B	VOST method evaluation	Carbon Tetrachloride	11.0 ± 0.3	+5	E
			Chloroform	47.4 ± 1.0	+3	
			Perchloroethylene	11.3 ± 0.3	+5	
			Benzene	25.2 ± 0.8	-7	
			Vinyl Chloride	19.8 ± 0.6	-85	
12	B	VOST method evaluation	Carbon Tetrachloride	6.6 ± 0.2	+21	E
			Chloroform	7.4 ± 0.2	+12	
			Perchloroethylene	21.9 ± 0.5	+56	
			Benzene	26.0 ± 0.8	+47	
			Vinyl Chloride	29.6 ± 0.9	-52	
13	E	Hazardous waste incineration trial burn analysis evaluation	Carbon Tetrachloride	11.6 ± 0.4	+11	E
			Chloroform	10.2 ± 0.2	+100	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
14	E	Hazardous waste incineration trial burn analysis evaluation	Carbon Tetrachloride	24.0 ± 0.7	-25	E
			Chloroform	16.0 ± 0.3	+31	
15	Region V U.S. EPA	Ambient air monitoring instrument checkout****	Carbon Tetrachloride	11.0 ± 0.3	-45	E
			Chloroform	47.4 ± 1.0	+58	
			Perchloroethylene	11.3 ± 0.3	-68	
			Benzene	25.2 ± 0.8	-56	
16A	G	Ambient air measurement method evaluation	Carbon Tetrachloride	13.4 ± 0.4	+1	E
			Chloroform	12.4 ± 0.3	+5	
			Perchloroethylene	75.6 ± 1.8	+18	
			Benzene	51.2 ± 1.6	-9	
			Vinyl Chloride	29.6 ± 0.9	+7	
16B	G	Ambient air measurement method evaluation	Carbon Tetrachloride	13.4 ± 0.4	+98	E
			Chloroform	12.4 ± 0.3	+140	
			Perchloroethylene	75.6 ± 1.8	+13	
			Benzene	51.2 ± 1.6	-8	
			Vinyl Chloride	29.6 ± 0.9	+6	
17	H	Hazardous waste incineration trial burn	Carbon Tetrachloride	9.9 ± 0.3	-19	E
			Chloroform	42.0 ± 0.9	-32	
			Perchloroethylene	9.6 ± 0.2	-14	
			Benzene	20.0 ± 0.6	-21	
			Vinyl Chloride	19.8 ± 0.6	-41	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
18A	I	Ambient air measurement method evaluation	Carbon Tetrachloride	132 ± 4.0	-17	E
			Chloroform	129 ± 2.7	+16	
			Perchloroethylene	136 ± 3.3	+18	
18A	I	Ambient air measurement method evaluation	Carbon Tetrachloride	9.5 ± 0.3	-23	E
			Chloroform	40.6 ± 0.9	+1	
			Perchloroethylene	9.5 ± 0.2	+16	
18B	I	Ambient air measurement method evaluation	Carbon Tetrachloride	132 ± 4.0	+38	E
			Chloroform	129 ± 2.7	+27	
			Perchloroethylene	136 ± 3.3	+34	
			Benzene	146 ± 4.7	+11	
			Vinyl Chloride	153 ± 4.9	-5	
18B	I	Ambient air measurement method evaluation	Carbon Tetrachloride	9.5 ± 0.3	+58	E
			Chloroform	40.6 ± 0.9	+35	
			Perchloroethylene	9.5 ± 0.2	+332	
			Benzene	19.4 ± 0.6	+240	
			Vinyl Chloride	20.6 ± 0.7	-3	
18C	I	Ambient air measurement method evaluation	Carbon Tetrachloride	132 ± 4.0	NA	F
			Chloroform	129 ± 2.7	NA	
			Perchloroethylene	136 ± 3.3	NA	
			Benzene	146 ± 4.7	NA	
			Vinyl Chloride	153 ± 4.9	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
18C	I	Ambient air measurement method evaluation	Benzene	19.4 ± 0.6	-2	E
19	B	Hazardous waste incineration trial burn	Carbon Tetrachloride	11.6 ± 0.3	+28	E
20	J	Hazardous waste incineration trial burn	Carbon Tetrachloride	11.6 ± 0.3	NA	F
			Chloroform	10.2 ± 0.2	NA	
			Perchloroethylene	67.7 ± 1.6	NA	
			Benzene	45.2 ± 1.4	NA	
			Vinyl Chloride	29.8 ± 1.0	NA	
21	K	Hazardous waste incineration trial burn	Carbon Tetrachloride	10.8 ± 0.3	NA	F
			Chloroform	47.1 ± 1.0	NA	
			Perchloroethylene	10.3 ± 0.2	NA	
			Benzene	23.2 ± 0.7	NA	
			Vinyl Chloride	20.1 ± 0.6	NA	
22	L	Hazardous waste incineration trial burn	Carbon Tetrachloride	12.7 ± 0.4	-21	E
			Chloroform	12.3 ± 0.3	-27	
			Perchloroethylene	62.2 ± 1.5	-44	
			Benzene	48.0 ± 1.5	-63	
			Vinyl Chloride	31.3 ± 1.0	-81	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
23	M	Ambient air measurement method evaluation	Carbon Tetrachloride	15.7 ± 0.5	-5	E
			Chloroform	15.2 ± 0.3	+5	
			Perchloroethylene	15.7 ± 0.4	+2	
			Benzene	18.2 ± 0.6	-12	
			Vinyl Chloride	15.4 ± 0.5	-29	
24	G	Ambient air measurement method evaluation	Methyl Ethyl Ketone	19.4 ± 1.1	+18	E
			Trichloroethylene	14.7 ± 0.7	+16	
			1,2-Dichloroethane	14.4 ± 0.7	+164	
			1,1,1-Trichloroethane	14.5 ± 0.7	+110	
25	I	Ambient air measurement method evaluation	Carbon Tetrachloride	7.1 ± 0.2	-16	E
			Chloroform	8.1 ± 0.2	-26	
			Perchloroethylene	21.1 ± 0.5	+4	
			Benzene	29.9 ± 1.0	-20	
			Vinyl Chloride	32.0 ± 1.0	-31	
26	N	Hazardous waste incineration trial burn	Trichlorofluoromethane	15.4 ± 0.5	-42	E
			Dichlorodifluoromethane	16.6 ± 0.7	-10	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
27A	I	Ambient air measurement method evaluation	Trichloroethylene	145 ± 7	+17	E
			1,2-Dichloroethane	157 ± 8	-5	
			1,2-Dibromoethane	196 ± 8	+63	
27A	I	Ambient air measurement method evaluation	Trichloroethylene	15.1 ± 0.7	+10	E
			1,2-Dichloroethane	14.7 ± 0.7	+54	
			1,2-Dibromoethane	16.8 ± 0.7	+16	
			1,1,1-Trichloroethane	14.8 ± 0.7	+19	
27B	I	Ambient air measurement method evaluation	Trichloroethylene	145 ± 7	-30	E
			Trichlorofluoromethane	155 ± 5	-3	
			Dichlorodifluoromethane	170 ± 7	-75	
			1,2-Dibromoethane	196 ± 8	-52	
27B	I	Ambient air measurement method evaluation	Trichloroethylene	15.1 ± 0.7	-52	E
			1,2-Dichloroethane	14.7 ± 0.7	-93	
			Trichlorofluoromethane	15.5 ± 0.5	-16	
			Dichlorodifluoromethane	16.7 ± 0.7	-71	
			1,2-Dibromoethane	16.8 ± 0.7	-73	
			1,1,1-Trichloroethane	14.8 ± 0.7	-16	
27C	I	Ambient air measurement method evaluation	Methyl Ethyl Ketone	170 ± 9	+2	E
			Trichloroethylene	145 ± 7	+36	
			Trichlorofluoromethane	155 ± 5	-63	
			Dichlorodifluoromethane	170 ± 7	-2	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
27C	I	Ambient air measurement method evaluation	Methyl Ethyl Ketone	8.5 ± 0.5	+124	E
			Trichloroethylene	15.1 ± 0.7	-1	
			Trichlorofluoromethane	15.5 ± 0.5	+158	
			Dichlorodifluoromethane	16.7 ± 0.7	+8	
			1,1,1-Trichloroethane	14.8 ± 0.7	+42	
28	O	Hazardous waste incineration trial burn	Carbon Tetrachloride	9.5 ± 0.3	+22	E
			Chloroform	40.6 ± 0.9	+9	
			Perchloroethylene	9.5 ± 0.2	+16	
			Benzene	19.4 ± 0.6	+17	
			Vinyl Chloride	20.6 ± 0.7	-13	
29	B	Hazardous waste incineration sampling method evaluation	Carbon Tetrachloride	11.4 ± 0.3	+5	E
			Chloroform	43.9 ± 0.9	+8	
			Perchloroethylene	10.3 ± 0.2	+20	
			Benzene	19.9 ± 0.6	+23	
30A	P	Ambient air measurement method evaluation	Trichloroethylene	15.1 ± 0.7	+12	E
30B	P	Ambient air measurement method evaluation	Trichloroethylene	15.1 ± 0.7	+70	E

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
31	Q	Ambient air measurement method evaluation	Carbon Tetrachloride	299 ± 9.0	-56	E
			Chloroform	126 ± 2.6	-33	
			Perchloroethylene	103 ± 2.5	-60	
			Benzene	378 ± 12.1	+18	
32	B	Hazardous waste incineration sampling method evaluation	Carbon Tetrachloride	9.6 ± 0.3	-1	E
			Chloroform	37.1 ± 0.8	+11	
			Perchloroethylene	9.1 ± 0.2	-18	
			Benzene	19.4 ± 0.6	+7	
33	B	Hazardous waste incineration sampling method evaluation	Carbon Tetrachloride	37.7 ± 1.1	-25	E
			Chloroform	8.3 ± 0.2	-24	
			Perchloroethylene	8.4 ± 0.2	-17	
			Benzene	40.7 ± 1.3	-26	
34	R	Ambient air measurement method evaluation	Carbon Tetrachloride	9.6 ± 0.3	NA	F
			Chloroform	37.1 ± 0.8	NA	
			Perchloroethylene	9.1 ± 0.2	NA	
			Benzene	19.4 ± 0.6	NA	
			Vinyl Chloride	20.4 ± 0.7	NA	
35	C	Ambient air measurement method evaluation	Chloroform	43.9 ± 0.9	+25	E
			Perchloroethylene	10.3 ± 0.2	+25	
			Benzene	19.9 ± 0.6	+25	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
36	C	Ambient air measurement method evaluation	Trichloroethylene	15.1 ± 0.7	+20	E
			1,1,1-Trichloroethane	14.8 ± 0.7	+29	
37	S	Hazardous waste incineration VOST method evaluation	Acetonitrile	7.9 ± 0.6	+377	E
			Trichloroethylene	9.0 ± 0.4	+39	
			Trichlorofluoromethane	9.4 ± 0.3	+3	
			1,2-Dibromoethane	10.2 ± 0.4	+1	
			1,1,1-Trichloroethane	10.1 ± 0.5	+7	
38	L	Ambient air monitoring measurement method evaluation	Carbon Tetrachloride	386.2 ± 2.6	-100	E
			Chloroform	331.0 ± 7.0	-96	
			Perchloroethylene	107.0 ± 7.4	-40	
			Benzene	137.0 ± 4.4	+13	
			Vinyl Chloride	150.0 ± 4.8	-39	
39	L	Ambient air measurement method evaluation	Acetonitrile	106 ± 7	-100	E
			Methyl Ethyl Ketone	123 ± 7	-65	
			Trichloroethylene	142 ± 7	-67	
			1,2-Dichloroethane	139 ± 7	-17	
			Trichlorofluoromethane	161 ± 6	+248	
			Bromomethane	168 ± 7	-100	
			Dichlorodifluoromethane	170 ± 7	-79	
			1,2-Dibromoethane	192 ± 8	-86	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
40	T	Ambient air measurement method evaluation (hazardous waste landfill)	Carbon Tetrachloride	11.4 ± 0.3	-29	E
			Chloroform	43.9 ± 0.9	-14	
			Perchloroethylene	10.3 ± 0.2	-15	
			Benzene	19.9 ± 0.6	-5	
41	T	Ambient air measurement method evaluation (hazardous waste landfill)	Trichloroethylene	15.1 ± 0.7	-7	E
			1,2-Dichloroethane	14.7 ± 0.7	-2	
			1,1,1-Trichloroethane	14.8 ± 0.7	-3	
42 (Lab A)	I	Ambient air measurement method evaluation	Carbon Tetrachloride	9.5 ± 0.3	+16	E
			Chloroform	37.3 ± 0.8	-4	
			Perchloroethylene	10.0 ± 0.2	0	
			Benzene	19.7 ± 0.6	-19	
			Vinyl Chloride	20.6 ± 0.7	-13	
42 (Lab A)	I	Ambient air measurement method evaluation	Carbon Tetrachloride	14.5 ± 0.4	+10	E
			Chloroform	3.7 ± 0.1	+8	
			Perchloroethylene	14.2 ± 0.3	+6	
			Benzene	12.2 ± 0.4	-10	
			Vinyl Chloride	11.6 ± 0.4	-22	
42 (Lab B)	I	Ambient air measurement method evaluation	Carbon Tetrachloride	9.5 ± 0.3	-5	E
			Chloroform	37.3 ± 0.8	+2	
			Perchloroethylene	10.2 ± 0.2	-20	
			Benzene	19.7 ± 0.6	-9	
			Vinyl Chloride	20.6 ± 0.7	-8	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
42 (Lab B)	I	Ambient air measurement method evaluation	Carbon Tetrachloride Chloroform Perchloroethylene Benzene Vinyl Chloride	14.5 ± 0.4 3.7 ± 0.1 14.2 ± 0.3 12.2 ± 0.4 11.6 ± 0.4	-17 -14 -15 -10 -5	E
42 (Lab C)	I	Ambient air measurement method evaluation	Benzene	19.7 ± 0.6	-9	E
42 (Lab C)	I	Ambient air measurement method evaluation	Benzene	12.2 ± 0.4	-18	E
42 (Lab D)	I	Ambient air measurement method evaluation	Carbon Tetrachloride Chloroform Perchloroethylene Benzene	9.5 ± 0.3 37.3 ± 0.8 10.0 ± 0.2 19.7 ± 0.6	+47 +18 +50 +2	E
42 (Lab D)	I	Ambient air measurement method evaluation	Carbon Tetrachloride Chloroform Perchloroethylene Benzene	14.5 ± 0.4 3.7 ± 0.1 14.2 ± 0.3 12.2 ± 0.4	+52 -5 +34 -2	E
43A	P	Ambient air measurement method evaluation	Trichloroethylene	142 ± 7.0	+1	E
43B	P	Ambient air measurement method evaluation	Trichloroethylene	142 ± 7.0	+44	E

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
44	U	Hazardous waste incineration trial burn	Carbon Tetrachloride	11.4 ± 0.3	-68	E
			Chloroform	43.9 ± 0.9	-25	
			Perchloroethylene	10.3 ± 0.2	+8	
			Benzene	19.9 ± 0.6	-20	
45	U	Hazardous waste incineration trial burn	Acetonitrile	13.8 ± 1.0	NA	F
			Methyl Ethyl Ketone	8.5 ± 0.5	NA	
			Trichloroethylene	15.1 ± 0.7	NA	
			1,2-Dichloroethane	14.7 ± 0.7	NA	
			Trichlorofluoromethane	15.5 ± 0.5	NA	
			Bromomethane	15.4 ± 0.6	NA	
			Dichlorodifluoromethane	16.7 ± 0.7	NA	
			1,2-Dibromoethane	16.8 ± 0.7	NA	
			1,1,1-Trichloroethane	14.8 ± 0.7	NA	
46	V	Ambient air analysis method evaluation	Perchloroethylene	21.1 ± 0.5	+118	E
			Benzene	25.9 ± 0.8	+8	
47	H	Hazardous waste incineration trial burn	Toluene	12.1	NA	F
48	EPA Region III Annapolis, MD	Ambient air measurement method evaluation	Chloroform	9.5 ± 0.3	-54	E
			Perchloroethylene	10.0 ± 0.2	+60	
			Benzene	19.7 ± 0.6	+42	
			Vinyl Chloride	20.6 ± 0.7	+70	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
49	EPA Region III Annapolis, MD	Ambient air measurement method evaluation	Trichloroethylene 1,1,1-Trichloroethane	14.2 ± 0.7 13.3 ± 0.7	+13 -10	E
50	V	Ambient air measurement method evaluation	Carbon Tetrachloride Chloroform Perchloroethylene Benzene Vinyl Chloride	9.6 ± 0.3 37.1 ± 0.8 9.1 ± 0.2 19.4 ± 0.6 20.4 ± 0.7	-5 +4 +1 +2 -2	E
51 (Lab A)	I	Ambient air measurement at hazardous waste landfill	Benzene	18.6 ± 0.6	+24	E
51 (Lab A)	I	Ambient air measurement at hazardous waste landfill	Benzene Vinyl Chloride	44.2 ± 1.4 48.5 ± 1.6	+6 +65	E
51 (Lab B)	I	Ambient air measurement at hazardous waste landfill	Vinyl Chloride	48.5 ± 1.6	-1	E
52	I	Ambient air measurement at hazardous waste landfill	Benzene Vinyl Chloride	44.2 ± 1.4 48.5 ± 1.6	NA NA	F
53	W	Hazardous waste incineration trial burn	Carbon Tetrachloride	12.3 ± 0.4	+24	E

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
54	Region II U.S. EPA	Ambient air measurement at hazardous waste landfill	Carbon Tetrachloride	46.0 ± 1.4	NA	F
			Chloroform	10.3 ± 0.2	NA	
			Perchloroethylene	10.7 ± 0.3	NA	
			Benzene	49.0 ± 1.6	NA	
			Vinyl Chloride	50.1 ± 1.6	NA	
55	Region II U.S. EPA	Ambient air measurement at hazardous waste landfill	Acetonitrile	24.2 ± 1.7	NA	F
			Methyl Ethyl Ketone	29.0 ± 1.6	NA	
			Trichloroethylene	28.2 ± 1.4	NA	
			1,2-Dichloroethane	27.3 ± 1.4	NA	
			Trichlorofluoromethane	29.5 ± 1.0	NA	
			Bromomethane	31.4 ± 1.2	NA	
			Dichlorodifluoromethane	29.4 ± 1.2	NA	
			1,2 Dibromoethane	32.6 ± 1.3	NA	
			1,1,1-Trichloroethane	27.7 ± 1.4	NA	
56	X	Ambient air analysis method evaluation	Vinyl Chloride	50.3 ± 1.6	-1	E
57	Y	Ambient air measurement method evaluation	Carbon Tetrachloride	12.0 ± 0.4	NA	F
			Chloroform	12.0 ± 0.3	NA	
			Perchloroethylene	64.3 ± 1.5	NA	
			Benzene	44.7 ± 1.4	NA	
			Vinyl Chloride	29.0 ± 0.9	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
58	V	Ambient air analysis method evaluation	Carbon Tetrachloride	9.6 ± 0.3	-5	E
			Chloroform	37.1 ± 0.8	+4	
			Perchloroethylene	9.1 ± 0.2	+1	
			Benzene	19.4 ± 0.6	+2	
			Vinyl Chloride	20.4 ± 0.7	-2	
59	I	Ambient air measurement at hazardous waste landfill	Carbon Tetrachloride	15.4 ± 0.5	NA	F
			Chloroform	14.8 ± 0.3	NA	
			Perchloroethylene	15.9 ± 0.4	NA	
			Benzene	16.9 ± 0.5	NA	
			Vinyl Chloride	15.4 ± 0.5	NA	
60A (Method 1)	I	Ambient air measurement at hazardous waste landfill	Trichloroethylene	9.5 ± 0.5	+10	E
			1,2-Dichloroethane	8.5 ± 0.4	+34	
			1,2 Dibromoethane	8.5 ± 0.3	+14	
			1,1,1-Trichloroethane	9.4 ± 0.5	+10	
60A (Method 2)	I	Ambient air measurement at hazardous waste land-	Trichloroethylene	9.5 ± 0.5	+6	E
			1,2 Dichloroethane	8.5 ± 0.4	+35	
			1,1,1-Trichloroethane	9.4 ± 0.5	+10	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
60B	I	Ambient air measurement at hazardous waste landfill	Trichloroethylene	9.5 ± 0.5	+58	E
			1,2-Dichloroethane	8.5 ± 0.4	+41	
			Trichlorofluoromethane	9.7 ± 0.3	+24	
			Bromomethane	11.4 ± 0.4	+5	
			1,2-Dibromoethane	8.5 ± 0.3	+64	
			1,1,1-Trichloroethane	9.4 ± 0.5	+60	
60C	I	Ambient air measurement at hazardous waste landfill	Trichloroethylene	9.5 ± 0.5	-34	E
			1,2-Dichloroethane	8.5 ± 0.4	+14	
			1,2-Dibromoethane	8.5 ± 0.3	-7	
			1,1,1-Trichloroethane	9.4 ± 0.5	+17	
60D	I	Ambient air measurement at hazardous waste landfill	Trichloroethylene	9.5 ± 0.5	+26	E
			1,2-Dichloroethane	8.5 ± 0.4	+6	
			1,2-Dibromoethane	8.5 ± 0.3	-7	
			1,1,1-Trichloroethane	9.4 ± 0.5	+4	
61	I	Ambient air measurement at hazardous waste landfill	Freon 114	7.2 ± 1.0	NA	F
			Freon 113	10.2 ± 1.0	NA	
			Vinylidene Chloride	12.5 ± 1.3	NA	
			Acetone	6.7 ± 2.1	NA	
			Toluene	10.5 ± 1.2	NA	
			1,4 Dioxane	10.1 ± 3.3	NA	
			Chlorobenzene	10.8 ± 1.3	NA	
62	U. S. EPA ASRL	Ambient air analysis method evaluation	Benzene	12.2 ± 0.4	-26	E

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
63A	JJ	Ambient air measurement method evaluation	Carbon tetrachloride	86.2 ± 2.6	NA	F
			Chloroform	331 ± 7.0	NA	
			Perchloroethylene	307 ± 7.4	NA	
			Benzene	137 ± 4.4	NA	
			Vinyl Chloride	150 ± 4.8	NA	
63B	JJ	Ambient air measurement method evaluation	Carbon Tetrachloride	132 ± 4.0	NA	F
			Chloroform	128 ± 2.7	NA	
			Perchloroethylene	137 ± 3.3	NA	
			Benzene	138 ± 4.4	NA	
			Vinyl Chloride	153 ± 4.9	NA	
63C	JJ	Ambient air measurement method evaluation	Carbon Tetrachloride	281 ± 8.4	NA	F
			Chloroform	223 ± 4.7	NA	
			Perchloroethylene	347 ± 8.3	NA	
			Benzene	302 ± 9.7	NA	
			Vinyl Chloride	308 ± 9.9	NA	
63D	JJ	Ambient air measurement at hazardous waste landfill	Carbon Tetrachloride	47.8 ± 1.5	NA	F
			Chloroform	10.8 ± 0.2	NA	
			Perchloroethylene	11.7 ± 0.3	NA	
			Benzene	52.3 ± 1.7	NA	
			Vinyl Chloride	50.4 ± 1.6	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
64A	JJ	Ambient air measurement at hazardous waste landfill	Acetonitrile	112 ± 7.8	NA	F
			Methyl Ethyl Ketone	140 ± 7.7	NA	
			Trichloroethylene	141 ± 6.8	NA	
			1,2-Dichloroethane	135 ± 6.9	NA	
			Trichlorofluoromethane	161 ± 5.5	NA	
			Bromomethane	168 ± 6.6	NA	
			Dichlroedifluoromethane	164 ± 6.7	NA	
			1,2-Dibromoethane	174 ± 7.1	NA	
			1,1,1-Trichloroethane	0	NA	
64B	JJ	Ambient air measurement at hazardous waste landfill	Acetonitrile	24.1 ± 1.7	NA	F
			Methyl Ethyl Ketone	28.0 ± 1.5	NA	
			Trichloroethylene	27.6 ± 1.3	NA	
			1,2-Dichloroethane	26.3 ± 1.3	NA	
			Trichlorofluoromethane	29.7 ± 1.0	NA	
			Bromoethane	31.3 ± 1.2	NA	
			Dichlorodifluoromethane	29.7 ± 1.2	NA	
			1,2-Dibromoethane	33.7 ± 1.4	NA	
			1,1,1-Trichloroethane	27.5 ± 1.4	NA	
64C	JJ	Ambient air measurement at hazardous waste landfill	Acetonitrile	37.6 ± 2.6	NA	F
			Methyl Ethyl Ketone	18.5 ± 1.0	NA	
			Trichloroethylene	38.4 ± 1.8	NA	
			1,2-Dichloroethane	39.3 ± 2.0	NA	
			Trichlorofluoromethane	38.5 ± 1.3	NA	
			Bromoethane	22.0 ± 0.9	NA	
			Dichlorodifluoromethane	20.8 ± 0.9	NA	
			1,2-Dibromoethane	21.7 ± 0.9	NA	
			1,1,1-Trichloroethane	18.2 ± 0.9	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
64D	JJ	Ambient air measurement at hazardous waste landfill	Acetonitrile	24.2 ± 1.7	NA	F
			Methyl Ethyl Ketone	29.0 ± 1.6	NA	
			Trichloroethylene	28.2 ± 1.4	NA	
			1,2-Dichloroethane	27.3 ± 1.4	NA	
			Trichlorofluoromethane	29.5 ± 1.0	NA	
			Bromomethane	31.4 ± 1.2	NA	
			Dichlroedifluoromethane	29.4 ± 1.2	NA	
			1,2-Dibromoethane	32.6 ± 1.3	NA	
			1,1,1-Trichloroethane	27.2 ± 1.4	NA	
65A	JJ	Ambient air measurement at hazardous waste landfill	Freon 114	27.6 ± 5.2	NA	F
			Freon 113	10.3 ± 1.3	NA	
			Vinylidene Chloride	32.4 ± 4.5	NA	
			Acetone	7.1 ± 2.2	NA	
			1,4-Dioxane	33.5 ± 11.2	NA	
			Toluene	10.4 ± 0.7	NA	
			Chlorobenzene	29.6 ± 5.0	NA	
65B	JJ	Ambient air measurement at hazardous waste landfill	Freon 114	25.7 ± 4.9	NA	F
			Freon 113	9.6 ± 1.2	NA	
			Vinylidene Chloride	31.8 ± 4.4	NA	
			Acetone	9.9 ± 3.1	NA	
			1,4-Dioxane	33.5 ± 11.0	NA	
			Toluene	10.2 ± 0.7	NA	
			Chlorobenzene	29.8 ± 5.0	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
65C	JJ	Ambient air measurement at hazardous waste landfill	Freon 114	24.6 ± 4.6	NA	F
			Freon 113	30.2 ± 3.9	NA	
			Vinylidene Chloride	30.7 ± 4.2	NA	
			Acetone	8.6 ± 2.6	NA	
			1,4-Dioxane	10.0 ± 3.2	NA	
			Toluene	12.3 ± 0.8	NA	
			Chlorobenzene	10.7 ± 1.8	NA	
66	KK	Ambient air measurement at hazardous waste landfill	Carbon Tetrachloride	265 ± 8.0	NA	F
			Chloroform	208 ± 4.4	NA	
			Perchloroethylene	295 ± 7.1	NA	
			Benzene	277 ± 8.9	NA	
			Vinyl Chloride	302 ± 9.7	NA	
67	KK	Ambient air measurement at hazardous waste landfill	Acetonitrile	109 ± 7.6	NA	F
			Methyl Ethyl Ketone	128 ± 7.0	NA	
			Trichloroethylene	139 ± 6.7	NA	
			1,2-Dichloroethane	139 ± 7.1	NA	
			Trichlorofluoromethane	158 ± 5.4	NA	
			Bromomethane	164 ± 6.4	NA	
			Dichlorodifluoromethane	148 ± 6.1	NA	
			1,2-Dibromoethane	164 ± 6.7	NA	
68	Z	Hazardous waste incineration trial burn	Carbon tetrachloride	12.3 ± 0.4	-43	E
			Chloroform	12.2 ± 0.3	+15	
69	Z	Hazardous waste incineration trial burn	Trichloroethylene	9.6 ± 0.5	-6	E

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
70	AA	Hazardous waste incineration trial burn	Trichloroethylene	15.1 ± 0.7	+92	E
			1,2-Dichloroethane	15.8 ± 0.8	+27	
			Trichlorofluoromethane	16.2 ± 0.5	-26	
			Bromomethane	14.0 ± 0.5	-57	
			Dichlorodifluoromethane	16.0 ± 0.7	+256	
			1,1,1-Trichloroethane	14.0 ± 0.7	+71	
71	HH	Hazardous waste incineration (boiler)	Carbon Tetrachloride	6.4 ± 0.2	+30	E
72	HH	Hazardous waste incineration (boiler)	1,1,1-Trichloroethane	13.3 ± 0.7	+31	E
73	HH	Hazardous waste incineration (boiler)	Toluene	10.3	+21	E
74	U.S. EPA ASRL	Ambient air analysis method evaluation	Benzene	19.4 ± 0.6	-8	E
75	II	Ambient air measurement at hazardous waste landfill	Carbon Tetrachloride	306 ± 9.2	NA	F
			Chloroform	223 ± 4.7	NA	
			Perchloroethylene	398 ± 9.6	NA	
			Benzene	325 ±10.4	NA	
			Vinyl Chloride	308 ± 9.9	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
76	V	Ambient air analysis method evaluation	Freon 114	9.1 ± 1.3	+34	E
			Freon 113	10.2 ± 1.0	+8	
			Vinylidene Chloride	8.7 ± 0.9	+1	
			Toluene	10.6 ± 1.3	+10	
			Chlorobenzene	11.1 ± 1.5	+11	
77	C	Ambient air analysis method evaluation	Carbon Tetrachloride	46.0 ± 1.4	+6	E
			Chloroform	10.3 ± 0.2	+1	
			Perchloroethylene	10.7 ± 0.3	-19	
			Benzene	49.0 ± 1.6	-9	
			Vinyl Chloride	50.1 ± 1.6	-24	
78	C	Ambient air analysis method evaluation	Trichloroethylene	9.4 ± 0.5	-5	E
			1,2-Dichloroethane	7.7 ± 0.4	+21	
			1,2-Dibromoethane	7.8 ± 0.3	-18	
			1,1,1-Trichloroethane	9.3 ± 0.5	+17	
79	H	Hazardous waste incineration trial burn	Carbon Tetrachloride	6.4 ± 0.2	-67	E
			Perchloroethylene	21.1 ± 0.5	-86	
80	H	Hazardous waste incineration trial burn	Trichloroethylene	14.2 ± 0.7	+20	E
			1,1,1-Trichloroethane	13.3 ± 0.7	+20	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
81	H	Hazardous waste incineration trial burn	Freon 114	8.5 ± 1.3	+131	E
			Freon 113	10.1 ± 1.0	0	
			Vinylidene Chloride	10.9 ± 1.0	-16	
			Acetone	27.6 ± 5.7	-18	
			Toluene	30.8 ± 3.6	+78	
			1,4-Dioxnane	28.8 ± 8.9	-79	
			Chlorobenzene	31.4 ± 3.6	+49	
82	CC	Hazardous waste incineration trial burn	Carbon Tetrachloride	37.2 ± 1.1	-5	E
			Chloroform	8.1 ± 0.2	+10	
83	DD	Ambient air measurement method evaluation	Carbon Tetrachloride	86.2 ± 2.6	+7	E
84	DD	Ambient air measurement method evaluation	Toluene	10.3 ± 1.2	+11	E
85	DD	Ambient air measurement method evaluation	Acetonitrile	12.2 ± 0.8	NA	F
			Methyl Ethyl Ketone	7.5 ± 0.4	NA	
			Trichloroethylene	15.1 ± 0.7	NA	
			1,2-Dichloroethane	15.8 ± 0.8	NA	
			Trichlorofluoromethane	16.2 ± 0.5	NA	
			Bromomethane	14.0 ± 0.5	NA	
			Dichlorodifluoromethane	16.0 ± 0.7	NA	
			1,2-Dibromoethane	11.8 ± 0.5	NA	
			1,1,1-Trichloroethane	14.0 ± 0.7	NA	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
86	FF	Hazardous waste incineration trial burn	Carbon Tetrachloride	11.0 ± 0.5	NA	F
			Chloroform	43.6 ± 0.9	NA	
			Perchoroethylene	11.6 ± 0.3	NA	
			Benzene	23.0 ± 0.7	NA	
			Vinyl Chloride	20.5 ± 0.7	NA	
87A	FF	Ambient air measurement at hazardous waste landfill	Acetonitrile	112 ± 7.8	NA	F
			Methyl Ethyl Ketone	140 ± 7.7	NA	
			Trichloroethylene	141 ± 6.8	NA	
			1,2-Dichloroethane	135 ± 6.9	NA	
			Trichlorofluoromethane	161 ± 5.5	NA	
			Bromomethane	168 ± 6.6	NA	
			Dichlorodifluoromethane	164 ± 6.7	NA	
			1,2-Dibromoethane	174 ± 7.1	NA	
87B	FF	Ambient air measurement at hazardous waste landfill	Carbon Tetrachloride	132 ± 4.0	NA	F
			Chloroform	128 ± 2.7	NA	
			Perchloroethylene	137 ± 3.3	NA	
			Benzene	138 ± 4.4	NA	
			Vinyl Chloride	153 ± 4.9	NA	
88	H	Hazardous waste incineration trial burn	Carbon Tetrachloride	6.4 ± 0.2	+33	E
			Perchloroethylene	21.1 ± 0.5	+33	
89	Z	Hazardous waste incineration trial burn	Carbon Tetrachloride	9.6 ± 0.3	+6	E
			Chloroform	37.1 ± 0.8	-2	

(Continued)

Table 4. Summary of Performance Audit Results (Continued)

Audit No.	Client***	Use of Audit Material	Audit Material	RTI Audit Conc. (ppb)	Client Audit % Bias (avg.)*	Status of Audit**
90	Z	Hazardous waste incineration trial burn	Trichloroethylene	13.2 ± 0.7	+5	E

$$\text{*Client \% Bias} = 100 \times \frac{\text{Client-Measured Concentration} - \text{RTI-Measured Concentration}}{\text{RTI-Measured Concentration}}$$

**Status Codes:
A = Cylinder shipped; audit results not yet received
B = Audit results received
C = Audit results submitted to EPA
D = Audit results received, audit report submitted to EPA, cylinder not yet returned from client
E = Audit complete
F = Audit completed without analysis of audit materials by client

***Whenever the auditee is known, an alphabetical letter is shown. Whenever the auditee is unknown, the name of the agency requesting the audit is shown.

****Audit of instrument calibration procedure.

SECTION 4

STABILITY STUDIES

An ideal calibration standard or audit material should be stable over its total time of usage. Such standards or materials may be considered stable if the results of reanalyses over time fall within the 95% confidence limits of the combined uncertainty for the preparation and analysis of the analyte concentrations.

The gas mixtures were analyzed twice by the manufacturer before shipment to RTI. These analyses were performed to verify that the components in the cylinder were stable at the manufacturing facility before shipment to RTI. The gas mixtures are then analyzed at RTI upon receipt from the specialty gas vendor to corroborate the vendors analysis. The gas mixtures are again analyzed by RTI at 2 months, 6 months, 12 months, and on an annual basis thereafter following the initial RTI analysis to determine the long term stability of the gas mixtures. The results of the analyses of the repository cylinders by the manufacturer and by RTI, along with the results for the RTI analysis of NBS primary standards are summarized in the stability data tables shown in Appendix A.

Relative accuracies of the cylinder gas analyses for Group I, Group II and Group III compounds have been determined using NBS primary standards on each day of RTI analysis. The method used by NBS to estimate the total uncertainty of NBS primary standards at the 95 percent confidence level has been reported.[1] The NBS concentrations and their total uncertainties at 95% confidence limits for Group I, Group II and Group III compounds are included in the stability data tables in Appendix A. These primary standards have been assessed for stability by NBS, and no change in concentrations has been observed that has exceeded the 95% confidence limit of the concentrations. The NBS maintains a continued QA program for these primary standards in which reanalyses are conducted over time to verify that the concentrations have not changed.

An examination of the stability data for the audit cylinders in Appendix A shows that values for the Group I, Group II and Group III compounds usually vary by less than 10 percent for 4 or 5 analyses over a 1-year period. This variation includes the uncertainty of the NBS primary standards and precision of the RTI measurement process. The possible sources of experimental error in the measurement process that contribute to this variability include: (1) the variability of the sampling injection technique used for analyses of the primary standards and the audit cylinders; and (2) the instrumental variability in operating and detector parameters. Each of these sources of variability contributes to the total uncertainty of the resulting data presented in Appendix A. The procedures used for the determination of day-to-day measurement uncertainty (repeatability) for Group I and Group II compounds have recently been published.[2]

The procedures used for the determination of day-to-day measurement uncertainty (repeatability) for Group III compounds are different from those for Group I and Group II. Permeation devices are not used to generate standards for Group III cylinder analysis. The total uncertainty for the measurements is arrived at by summing in quadrature the estimates of error from several sources. These sources of error include:

1. NBS uncertainties associated with concentration values reported by NBS for the primary standard cylinder;
2. Uncertainties associated with the RTI injection of the primary NBS calibration cylinder, and the error associated with peak height measurement;
3. Uncertainties associated with the RTI injection of the sample cylinder and the error associated with the peak height measurement.

The analytical results are reported as the mean parts-per-billion value for three replicate injections of a given sample cylinder plus or minus the calculated total uncertainty in parts-per-billion. The total uncertainty at the 95% confidence limits is calculated as follows:

$$\overline{x} \pm \frac{2\sqrt{a^2 + b^2 + C^2}}{\sqrt{2}}$$

where: $\overline{x}$ = Mean concentration in ppb;

a = NBS uncertainties associated with the concentration values reported by NBS for the primary standard cylinder, expressed in percent;

b = Uncertainties associated with the RTI injection of the primary NBS calibration cylinder, and the error associated with peak height measurement, expressed in percent;

c = Uncertainties associated with the RTI injection of the sample cylinders and the error associated with peak height measurement, expressed in percent.

The total uncertainty at the 95% confidence limit in percent is multiplied by the mean concentration value ($\overline{X}$) in parts-per-billion to obtain the total uncertainty at 95% confidence limits in parts-per-billion.

Estimates of total uncertainty (repeatability) for Group I compounds were found to be in the range of 2.1-3.2% (coefficient of variation) at the 95% confidence limits. The estimates of total uncertainty for Group II compounds were found to be in the range of 3.4-7.0% (coefficient of variation) at the 95% confidence limits. The total uncertainties for the Group III compounds (with the exception of acetone and 1,4-dioxane) were found to be in the range of 9.0-12.0% (coefficient of variation) at the 95% confidence limits. Acetone and 1,4-dioxane initially had quite high total uncertainties in the range of 50% (coefficient of variation) at the 95% confidence limits, due to difficulties in the analysis of these two compounds. An improvement in the analysis of these two compounds reduced their uncertainties; the total uncertainties for acetone and 1,4-dioxane are presently in the range of 30-32% (coefficient of variation) at the 95% confidence limits.

SECTION 5

SUMMARY AND CONCLUSIONS

Compressed gas cylinders containing 21 gaseous organic compounds at parts-per-billion levels has been used successfully in audits to assess the relative accuracy of analytical systems, especially those used during hazardous waste trial burn tests and ambient air monitoring. The repository consists of four mixtures of five, six, eight and nine organic compounds each. These mixtures were blended by a commercial specialty gas supplier in aluminum cylinders in a balance gas of nitrogen. The five component mixture (Group I) contains carbon tetrachloride, chloroform, tetrachloroethylene (perchloroethylene), vinyl chloride and benzene. The nine component mixture (Group II) includes trichloroethylene, 1,2-dichloroethane, 1,2-dibromoethane, acetonitrile, trichlorofluoromethane (F-11), dichlorodifluoromethane (F-12), bromomethane, methyl ethyl ketone and 1,1,1-trichloroethane. The eight component mixture (Group III) includes pyridine*, vinylidene chloride, 1,1,2-trichloro 1,2,2-trifluoroethane (F-113), 1,2- dichloro 1,1,2,2-tetrafluoroethane (F-114), acetone, 1,4-dioxane, toluene, and chlorobenzene. The six component mixture (Group IV) includes acrylonitrile, 1,3-butadiene, ethylene oxide, methylene chloride, propylene oxide, and o-xylene.

Stability studies for 21 compounds (Group I, Group II, and Group III) have been performed to determine the feasibility of using them as audit materials. Results indicate that all of the organics tested are stable enough to be used as reliable audit materials. The Group IV compounds will not be available for audits until stability of the compounds have been established. If the data indicates that the Group IV compounds are stable, Group IV mixtures should be available for audits on or after December 1, 1986.

Subsequent to completion of the stability studies, 95 performance audits have been initiated to date with Group I, Group II and Group III cylinders and 76 are complete. Generally, the audit results are within ± 50 percent of the audit concentrations measured by RTI.

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*Although Group III cylinders contain pyridine, it is not included in the repository due to severe analytical difficulties.

REFERENCES

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2. Jayanty, R. K. M., S. W. Cooper, C. E. Decker and D. J. von Lehmden, "Evaluation of Parts-Per-Billion (PPB) Organic Cylinder Gases for Use as Audits During Hazardous Waste Trial Burn Tests". J. Air Pollution Control Association, Vol. 39, November 1985.

APPENDIX A

STABILITY STUDY FOR GROUP I COMPOUNDS
STABILITY STUDY FOR GROUP II COMPOUNDS
STABILITY STUDY FOR GROUP III COMPOUNDS

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C1

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(305)	(302)	(305)	(305)	—
1st Analysis Date PPB	10/13/83 (300)	10/13/83 (220)	10/13/83 (317)	11/15/83 (269)	11/15/83 (310)
2nd Analysis Date PPB	12/14/83 (269)	12/14/83 (253)	12/14/83 (298)	12/12/83 (282)	12/12/83 (314)
RTI ANALYSIS					
1st RTI Analysis Date PPB	12/30/83 (283 ± 8.5)	12/30/83 (222 ± 4.7)	12/30/83 (373 ± 9.0)	1/12/84 (289 ± 9.2)	1/12/84 (325 ± 10.4)
2nd RTI Analysis Day* PPB	62 (300 ± 9.0)	62 (228 ± 4.8)	62 (375 ± 9.0)	62 (287 ± 9.2)	62 (328 ± 10.5)
3rd RTI Analysis Day* PPB	241 (277 ± 8.3)	241 (221 ± 4.6)	241 (347 ± 8.3)	235 (304 ± 9.7)	235 (325 ± 10.4)
4th RTI Analysis Day* PPB	404 (277 ± 8.3)	404 (224 ± 4.7)	404 (356 ± 8.5)	378 (286 ± 9.2)	378 (334 ± 10.7)
5th RTI Analysis Day* PPB	on audit	on audit	on audit	(302 ± 97)	(319 ± 10.2)
6th RTI Analysis Day* PPB	833 (279 ± 8.3)	833 (220 ± 4.7)	833 (359 ± 8.8)	810 (297 ± 9.6)	810 (338 ± 11.1)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	NA	NA	NA	NA	NA
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C1

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	62	62
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(192 ± 6.1)	(192 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
3rd RTI Analysis Day	241	241	241	235	235
PPB	(156 ± 4.7)	(132 ± 2.8)	(147 ± 3.5)	(191 ± 6.1)	(191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day	404	404	404	378	378
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(200 ± 6.4)	(195 ± 6.2)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	500	500	500	505	505
PPB	(141 ± 4.2)	(115 ± 2.4)	(128 ± 3.1)	(139 ± 4.4)	(149 ± 4.8)
NBS Concentration** PPB	(141 ± 3)	(115 ± 3)	(128 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(166 ± 5.0)	(130 ± 2.7)	(144 ± 3.5)	(143 ± 4.6)	(156 ± 5.1)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C2

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(319)	(316)	(319)	(319)	—
1st Analysis Date	10/13/83	10/13/83	10/13/83	12/12/83	12/12/83
PPB	(301)	(243)	(356)	(317)	(292)
2nd Analysis Date	12/14/83	12/14/83	12/14/83	12/14/83	12/14/83
PPB	(295)	(258)	(342)	(294)	(293)
RTI ANALYSIS					
1st RTI Analysis Date	12/30/83	12/30/83	12/30/83	1/12/84	1/12/84
PPB	(315 ± 9.5)	(226 ± 4.7)	(425 ± 10.2)	(305 ± 9.8)	(295 ± 9.4)
2nd RTI Analysis Day*	62	62	62	62	62
PPB	(327 ± 9.8)	(233 ± 4.9)	(436 ± 10.5)	(314 ± 10.0)	(303 ± 9.7)
3rd RTI Analysis Day*	241	241	241	235	235
PPB	(305 ± 9.2)	(230 ± 4.8)	(406 ± 9.7)	(326 ± 10.4)	(304 ± 9.7)
4th RTI Analysis Day*	404	404	404	378	378
PPB	(305 ± 9.2)	(229 ± 4.8)	(407 ± 9.8)	(313 ± 10.0)	(309 ± 9.9)
5th RTI Analysis Day*	500	500	500	502	502
PPB	(306 ± 9.2)	(223 ± 4.7)	(398 ± 9.6)	(325 ± 10.4)	(308 ± 9.9)
6th RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
RTI QUALITY CONTROL**					
1st RTI Analysis Date					
PPB	NA	NA	NA	NA	NA
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C2

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	62	62
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(192 ± 6.1)	(192 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
3rd RTI Analysis Day	241	241	241	235	235
PPB	(156 ± 4.7)	(132 ± 2.8)	(147 ± 3.5)	(191 ± 6.1)	(191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day	404	404	404	378	378
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(200 ± 6.4)	(195 ± 6.2)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	500	500	500	502	502
PPB	(141 ± 4.2)	(115 ± 2.4)	(128 ± 3.1)	(137 ± 4.4)	(145 ± 4.6)
NBS Concentration** PPB	(141 ± 3)	(115 ± 3)	(128 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(166 ± 5.0)	(130 ± 2.7)	(144 ± 3.5)	(143 ± 4.6)	(156 ± 5.1)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C3

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(294)	(291)	(293)	(294)	(290)
1st Analysis Date	10/13/83	10/13/83	10/13/83	11/15/83	11/15/83
PPB	(308)	(223)	(321)	(271)	(287)
2nd Analysis Date	12/14/83	12/14/83	12/14/83	12/12/83	12/12/83
PPB	(272)	(256)	(299)	(284)	(290)
RTI ANALYSIS					
1st RTI Analysis Date	12/30/83	12/30/83	12/30/83	1/12/84	1/12/84
PPB	(287 ± 8.6)	(224 ± 4.7)	(373 ± 9.0)	(288 ± 9.2)	(295 ± 9.4)
2nd RTI Analysis Day*	62	62	62	62	62
PPB	(303 ± 9.1)	(234 ± 4.9)	(369 ± 8.9)	(289 ± 9.2)	(302 ± 9.7)
3rd RTI Analysis Day*	241	241	241	235	235
PPB	(283 ± 8.5)	(230 ± 4.8)	(352 ± 8.4)	(300 ± 9.6)	(306 ± 9.8)
4th RTI Analysis Day*	404	404	404	378	378
PPB	(280 ± 8.4)	(229 ± 4.8)	(354 ± 8.5)	(289 ± 9.2)	(308 ± 9.9)
5th RTI Analysis Day*	500	500	500	502	502
PPB	(281 ± 8.4)	(223 ± 4.7)	(347 ± 8.3)	(302 ± 9.7)	(308 ± 9.9)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(291 ± 8.7)	(232 ± 4.9)	(365 ± 9.0)	(300 ± 9.7)	(312 ± 10.2)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	NA	NA	NA	NA	NA
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C3

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	62	62
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(192 ± 6.1)	(192 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
3rd RTI Analysis Day	241	241	241	235	235
PPB	(156 ± 4.7)	(132 ± 2.8)	(147 ± 3.5)	(191 ± 6.1)	(191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day	404	404	404	378	378
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(200 ± 6.4)	(195 ± 6.2)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	500	500	500	502	502
PPB	(141 ± 4.2)	(115 ± 2.4)	(128 ± 3.1)	(137 ± 4.4)	(145 ± 4.6)
NBS Concentration** PPB	(141 ± 3)	(115 ± 3)	(128 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(166 ± 5.0)	(130 ± 2.7)	(144 ± 3.5)	(143 ± 4.6)	(156 ± 5.1)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C4

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(268)	(271)	(271)	(274)	-?-
1st Analysis Date	12/09/83	12/09/83	12/09/83	12/02/83	12/02/83
PPB	(267)	(232)	(281)	(248)	(283)
2nd Analysis Date	12/14/83	12/14/83	12/14/83	12/12/83	12/12/83
PPB	(256)	(241)	(259)	(262)	(287)
RTI ANALYSIS					
1st RTI Analysis Date	12/30/83	12/30/83	12/30/83	1/12/84	1/12/84
PPB	(270 ± 8.1)	(211 ± 4.4)	(308 ± 7.4)	(263 ± 8.4)	(291 ± 9.3)
2nd RTI Analysis Day*	62	62	62	62	62
PPB	(278 ± 8.3)	(214 ± 4.5)	(317 ± 7.6)	(263 ± 8.4)	(296 ± 9.5)
3rd RTI Analysis Day*	241	241	241	235	235
PPB	(267 ± 8.0)	(214 ± 4.5)	(299 ± 7.2)	(281 ± 9.0)	(300 ± 9.6)
4th RTI Analysis Day*	404	404	404	378	378
PPB	(266 ± 8.0)	(216 ± 4.5)	(311 ± 7.5)	(266 ± 8.5)	(301 ± 9.6)
5th RTI Analysis Day*	500	500	500	502	502
PPB	(265 ± 8.0)	(208 ± 4.4)	(295 ± 7.1)	(277 ± 8.9)	(302 ± 9.7)
6th RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
RTI QUALITY CONTROL**					
1st RTI Analysis Date					
PPB	NA	NA	NA	NA	NA
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C4

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	62	62
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(192 ± 6.1)	(192 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
3rd RTI Analysis Day	241	241	241	235	235
PPB	(156 ± 4.7)	(132 ± 2.8)	(147 ± 3.5)	(191 ± 6.1)	(191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day	404	404	404	378	378
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(200 ± 6.4)	(195 ± 6.2)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	500	500	500	502	502
PPB	(141 ± 4.2)	(115 ± 2.4)	(128 ± 3.1)	(137 ± 4.4)	(145 ± 4.6)
NBS Concentration** PPB	(141 ± 3)	(115 ± 3)	(128 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(161 ± 4.8)	(132 ± 2.8)	(148 ± 3.6)	(139 ± 4.5)	(153 ± 5.0)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C5

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(133)	(132)	(133)	(134)	150
1st Analysis Date	10/31/83	10/31/83	10/31/83	11/16/83	11/16/83
PPB	(122)	(123)	(124)	(127)	(143)
2nd Analysis Date	12/10/83	12/10/83	12/10/83	12/13/83	12/13/83
PPB	(118)	(130)	(119)	(131)	(146)
RTI ANALYSIS					
1st RTI Analysis Date	12/30/83	12/30/83	12/30/83	1/17/84	1/17/84
PPB	(133 ± 4.1)	(125 ± 2.6)	(138 ± 3.3)	(132 ± 4.2)	(154 ± 4.9)
2nd RTI Analysis Day*	62	62	62	54	54
PPB	(139 ± 4.2)	(130 ± 2.7)	(144 ± 3.5)	(139 ± 4.4)	(152 ± 4.9)
3rd RTI Analysis Day*	242	242	242	230	230
PPB	(132 ± 4.0)	(129 ± 2.7)	(136 ± 3.3)	(146 ± 4.7)	(153 ± 4.9)
4th RTI Analysis Day*	404	404	404	374	374
PPB	(124 ± 3.7)	(125 ± 2.6)	(135 ± 3.2)	(140 ± 4.5)	(154 ± 4.9)
5th RTI Analysis Day*	501	501	501	498	498
PPB	(132 ± 4.0)	(128 ± 2.7)	(137 ± 3.3)	(139 ± 4.4)	(154 ± 4.9)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(137 ± 4.1)	(132 ± 2.8)	(142 ± 3.5)	(137 ± 4.4)	(149 ± 4.9)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	——	——	——	1/17/84	1/17/84
PPB	NA	NA	NA	(135)	(155)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C5

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	54	54
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(141 ± 4.5)	(153 ± 4.9)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
3rd RTI Analysis Day	242	242	242	230	230
PPB	(157 ± 4.7)	(133 ± 2.8)	(144 ± 3.5)	(147 ± 4.7)	(153 ± 4.9)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day	404	404	404	374	374
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(147 ± 4.7)	(152 ± 4.9)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	501	501	501	498	498
PPB	(142 ± 4.3)	(115 ± 2.4)	(126 ± 3.0)	(139 ± 4.4)	(154 ± 4.9)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(161 ± 4.8)	(132 ± 2.8)	(148 ± 3.6)	(139 ± 4.5)	(153 ± 5.0)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C6

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(134)	(133)	(134)	(135)	(15)
1st Analysis Date	10/31/83	10/31/83	10/31/83	11/16/83	11/16/83
PPB	(126)	(126)	(128)	(128)	(142)
2nd Analysis Date	12/10/83	12/10/83	12/10/83	12/12/83	12/12/83
PPB	(115)	(129)	(114)	(133)	(143)
RTI ANALYSIS					
1st RTI Analysis Date	12/30/83	12/30/83	12/30/83	1/17/84	1/17/84
PPB	(134 ± 4.0)	(124 ± 2.6)	(137 ± 3.3)	(136 ± 4.4)	(155 ± 5.0)
2nd RTI Analysis Day*	62	62	62	54	54
PPB	(137 ± 4.1)	(128 ± 2.7)	(140 ± 3.4)	(138 ± 4.4)	(150 ± 4.8)
3rd RTI Analysis Day*	242	242	242	230	230
PPB	(131 ± 3.9)	(129 ± 2.7)	(135 ± 3.2)	(147 ± 4.7)	(152 ± 4.9)
4th RTI Analysis Day*	404	404	404	374	374
PPB	(129 ± 3.9)	(126 ± 2.6)	(135 ± 3.2)	(140 ± 4.5)	(148 ± 4.7)
5th RTI Analysis Day*	501	501	501	498	498
PPB	(132 ± 4.0)	(128 ± 2.7)	(137 ± 3.3)	(138 ± 4.4)	(153 ± 4.9)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(134 ± 4.0)	(129 ± 2.7)	(137 ± 3.4)	(139 ± 4.5)	(151 ± 4.9)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	—	—	—	1/17/84	1/17/84
PPB	NA	NA	NA	(135 ± 4.3)	(155 ± 5.0)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C6

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	54	54
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(141 ± 4.5)	(153 ± 4.9)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
3rd RTI Analysis Day	242	242	242	230	230
PPB	(157 ± 4.7)	(133 ± 2.8)	(144 ± 3.5)	(147 ± 4.7)	(153 ± 4.9
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day	404	404	404	374	374
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(147 ± 4.7)	(152 ± 4.9)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	501	501	501	498	498
PPB	(142 ± 4.3)	(115 ± 2.4)	(126 ± 3.0)	(139 ± 4.4)	(154 ± 4.9)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(161 ± 4.8)	(132 ± 2.8)	(148 ± 3.6)	(139 ± 4.5)	(153 ± 5.0)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C7

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(134)	(132)	(133)	(134)	(150)
1st Analysis Date	10/31/83	10/31/83	10/31/83	12/01/83	12/01/83
PPB	(122)	(124)	(124)	(127)	(146)
2nd Analysis Date	12/10/83	12/10/83	12/10/83	12/13/83	12/13/83
PPB	(117)	(126)	(113)	(131)	(143)
RTI ANALYSIS					
1st RTI Analysis Date	12/30/83	12/30/83	12/30/83	1/17/84	1/17/84
PPB	(132 ± 4.0)	(125 ± 2.6)	(139 ± 3.3)	(132 ± 4.2)	(155 ± 5.0)
2nd RTI Analysis Day*	62	62	62	54	54
PPB	(135 ± 4.1)	(127 ± 2.7)	(142 ± 3.4)	(138 ± 4.4)	(152 ± 4.9)
3rd RTI Analysis Day*	242	242	242	230	230
PPB	(133 ± 4.0)	(129 ± 2.7)	(135 ± 3.2)	(145 ± 4.6)	(154 ± 4.9)
4th RTI Analysis Day*	404	404	404	374	374
PPB	(128 ± 3.8)	(125 ± 2.6)	(140 ± 3.4)	(141 ± 4.5)	(156 ± 5.0)
5th RTI Analysis Day*	501	501	501	498	498
PPB	(131 ± 3.9)	(125 ± 2.6)	(137 ± 3.3)	(137 ± 4.4)	(156 ± 5.0)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(134 ± 4.0)	(129 ± 2.7)	(139 ± 3.4)	(137 ± 4.4)	(151 ± 4.9)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	—	—	—	1/17/84	1/17/84
PPB	NA	NA	NA	(135 ± 4.3)	(155 ± 5.0)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C7

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	54	54
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(141 ± 4.5)	(153 ± 4.9)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
3rd RTI Analysis Day	242	242	242	230	230
PPB	(157 ± 4.7)	(133 ± 2.8)	(144 ± 3.5)	(147 ± 4.7)	(153 ± 4.9)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day	404	404	404	374	374
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(147 ± 4.7)	(152 ± 4.9)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	501	501	501	498	498
PPB	(142 ± 4.3)	(115 ± 2.40	(126 ± 3.0)	(139 ± 4.4)	(154 ± 4.9)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
	(161 ± 4.8)	(132 ± 2.8)	(148 ± 3.6)	(139 ± 4.5)	(153 ± 5.0)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C8

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(128)	(126)	(127)	(128)	(150)
1st Analysis Date PPB	10/31/83 (117)	10/31/83 (119)	10/31/83 (125)	11/16/83 (121)	11/16/83 (147)
2nd Analysis Date PPB	12/10/83 (113)	12/10/83 (126)	12/10/83 (116)	12/13/83 (125)	12/13/83 (148)
RTI ANALYSIS					
1st RTI Analysis Date PPB	12/30/83 (127 ± 3.8)	12/30/83 (119 ± 2.5)	12/30/83 (131 ± 3.1)	1/17/84 (127 ± 4.1)	1/17/84 (158 ± 5.1)
2nd RTI Analysis Day* PPB	62 (131 ± 3.9)	62 (122 ± 2.6)	62 (134 ± 3.2)	54 (133 ± 4.3)	54 (154 ± 4.9)
3rd RTI Analysis Day* PPB	242 (127 ± 3.8)	242 (123 ± 2.6)	242 (129 ± 3.1)	230 (140 ± 4.5)	230 (153 ± 4.9)
4th RTI Analysis Day* PPB	404 (124 ± 3.7)	404 (117 ± 2.5)	404 (131 ± 3.1)	374 (143 ± 4.6)	374 (154 ± 4.9)
5th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
6th RTI Analysis Day* PPB	833 (129 ± 3.8)	833 (123 ± 2.6)	833 (131 ± 3.2)	810 (130 ± 4.2)	810 (153 ± 5.0)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	— NA	— NA	— NA	1/17/84 (135 ± 4.3)	1/17/84 (155 ± 5.0)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C8

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	62	62	62	54	54
PPB	(164 ± 4.9)	(130 ± 2.7)	(151 ± 3.6)	(141 ± 4.5)	(153 ± 4.9)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
3rd RTI Analysis Day	242	242	242	230	230
PPB	(157 ± 4.7)	(133 ± 2.8)	(144 ± 3.5)	(147 ± 4.7)	(153 ± 4.9)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day	404	404	404	374	374
PPB	(156 ± 4.7)	(128 ± 2.7)	(143 ± 3.4)	(147 ± 4.7)	(152 ± 4.9)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	501	501	501	498	498
PPB	(142 ± 4.3)	(115 ± 2.4)	(126 ± 3.0)	(139 ± 4.4)	(154 ± 4.9)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(161 ± 4.8	(132 ± 2.8)	(148 ± 3.6)	(139 ± 4.5)	(153 ± 5.0)
NBS Concentration** PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C9

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(70.8)	(70.0)	(70.6)	(71.0)	(70.0)
1st Analysis Date PPB	10/25/83 (72.5)	10/25/83 (68.9)	10/25/83 (72.7)	11/28/83 (67.2)	11/28/83 (70.6)
2nd Analysis Date PPB	12/12/83 (68.3)	12/12/83 (72.3)	12/12/83 (69.8)	12/13/83 (73.1)	12/13/83 (69.6)
RTI ANALYSIS					
1st RTI Analysis Date PPB	1/04/84 (72.8 ± 2.2)	1/04/84 (65.3 ± 1.4)	1/04/84 (74.6 ± 1.8)	1/17/84 (76.2 ± 2.4)	1/17/84 (72.9 ± 2.3)
2nd RTI Analysis Day* PPB	58 (73.7 ± 2.2)	58 (68.6 ± 1.4)	58 (76.2 ± 1.8)	51 (73.2 ± 2.3)	51 (73.1 ± 2.3)
3rd RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
4th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
5th RTI Analysis Day* PPB	497 (71.7 ± 2.2)	497 (68.8 ± 1.4)	497 (71.6 ± 1.7)	499 (72.6 ± 2.3)	499 (71.0 ± 2.3)
6th RTI Analysis Day* PPB	833 (79.6 ± 2.3)	833 (72.2 ± 1.5)	833 (79.6 ± 2.0)	810 (75.6 ± 2.4)	810 (69.3 ± 2.2)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	1/04/84 (144 ± 4.3)	1/04/84 (114 ± 2.4)	1/04/84 (127 ± 3.0)	1/17/84 (135 ± 4.3)	1/17/84 (155 ± 5.0)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C9

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	58 (147 ± 4.4)	58 (116 ± 2.4)	58 (134 ± 3.2)	51 (17.0 ± 0.5)	51 (15.0 ± 0.5)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	240 (146 ± 4.4)	240 (120 ± 2.5)	240 (131 ± 3.1)	231 (146 ± 4.7)	231 (152 ± 4.9)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day PPB	401 (142 ± 4.3)	401 (120 ± 2.5)	401 (127 ± 3.0)	377 (136 ± 4.4)	377 (150 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
5th RTI Analysis Day PPB	497 (141 ± 4.2)	497 (116 ± 2.4)	497 (129 ± 3.1)	499 (136 ± 4.4)	499 (149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day PPB	833 (144 ± 4.3)	833 (119 ± 2.5)	833 (135 ± 3.3)	810 (139 ± 4.5)	810 (153 ± 5.0)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C10

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
			MANUFACTURER ANALYSIS		
Theoretical PPB	(66.0)	(65.2)	(65.8)	(66.2)	(70.0)
1st Analysis Date PPB	10/25/83 (65.2)	10/25/83 (64.8)	10/25/83 (67.9)	11/28/83 (61.0)	11/28/83 (70.1)
2nd Analysis Date PPB	12/12/83 (62.5)	12/12/83 (66.1)	12/12/83 (64.6)	12/13/83 (66.0)	12/13/83 (67.5)
			RTI ANALYSIS		
1st RTI Analysis Date PPB	1/04/84 (66.5 ± 2.0)	1/04/84 (58.6 ± 1.2)	1/04/84 (67.7 ± 1.6)	1/17/84 (68.7 ± 2.2)	1/17/84 (71.3 ± 2.3)
2nd RTI Analysis Day* PPB	58 (65.8 ± 2.0)	58 (60.6 ± 1.3)	58 (68.4 ± 1.6)	51 (66.4 ± 2.1)	51 (71.5 ± 2.3)
3rd RTI Analysis Day* PPB	240 (67.6 ± 2.0)	240 (64.6 ± 1.4)	240 (69.4 ± 1.7)	231 (72.0 ± 2.3)	231 (71.6 ± 2.3)
4th RTI Analysis Day* PPB	401 (65.2 ± 2.0)	401 (63.6 ± 1.3)	401 (71.7 ± 1.7)	377 (70.4 ± 2.3)	377 (68.5 ± 2.2)
5th RTI Analysis Day* PPB	497 (64.0 ± 1.9)	497 (62.7 ± 1.3)	497 (64.3 ± 1.5)	499 (66.0 ± 2.1)	499 (69.0 ± 2.2)
6th RTI Analysis Day* PPB	833 (70.0 ± 2.1)	833 (64.3 ± 1.4)	833 (72.3 ± 1.8)	810 (68.2 ± 2.2)	810 (71.7 ± 2.3)
			RTI QUALITY CONTROL**		
1st RTI Analysis Date PPB	1/04/84 (144 ± 4.3)	1/04/84 (114 ± 2.4)	1/04/84 (127 ± 3.0)	1/17/84 (135 ± 4.3)	1/17/84 (155 ± 5.0)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C10

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	58	58	58	51	51
PPB	(147 ± 4.4)	(116 ± 2.4)	(134 ± 3.2)	(17.0 ± 0.5)	(15.0 ± 0.5)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	240	240	240	231	231
PPB	(146 ± 4.4)	(120 ± 2.5)	(131 ± 3.1)	(146 ± 4.7)	(152 ± 4.9)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day	401	401	401	377	377
PPB	(142 ± 4.3)	(120 ± 2.5)	(127 ± 3.0)	(136 ± 4.4)	(150 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
5th RTI Analysis Day	497	497	497	499	499
PPB	(141 ± 4.2)	(116 ± 2.4)	(129 ± 3.1)	(136 ± 4.4)	(149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(144 ± 4.3)	(119 ± 2.5)	(135 ± 3.3)	(139 ± 4.5)	(153 ± 5.0)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C11

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(66.6)	(65.8)	(66.3)	(66.7)	(70.0)
1st Analysis Date	10/25/83	10/25/83	10/25/83	12/02/83	12/02/83
PPB	(65.4)	(62.4)	(65.5)	(61.7)	(66.5)
2nd Analysis Date	12/12/83	12/12/83	12/12/83	12/13/83	12/13/83
PPB	(62.3)	(65.1)	(64.8)	(65.3)	(67.7)
RTI ANALYSIS					
1st RTI Analysis Date	1/04/84	1/04/84	1/04/84	1/17/84	1/17/84
PPB	(66.5 ± 2.0)	(58.1 ± 1.2)	(66.4 ± 1.6)	(67.4 ± 2.2)	(69.7 ± 2.2)
2nd RTI Analysis Day*	58	58	58	51	51
PPB	(67.5 ± 2.0)	(60.5 ± 1.3)	(70.0 ± 1.7)	(64.8 ± 2.1)	(69.2 ± 2.2)
3rd RTI Analysis Day*	240	240	240	231	231
PPB	(68.2 ± 2.0)	(64.6 ± 1.4)	(69.6 ± 1.7)	(71.1 ± 2.3)	(69.8 ± 2.2)
4th RTI Analysis Day*	401	401	401	377	377
PPB	(65.2 ± 2.0)	(63.6 ± 1.3)	(71.7 ± 1.7)	(70.4 ± 2.3)	(68.5 ± 2.2)
5th RTI Analysis Day*	497	497	497	499	499
PPB	(65.3 ± 2.0)	(62.7 ± 1.3)	(63.5 ± 1.5)	(69.1 ± 2.2)	(68.7 ± 2.2)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(70.8 ± 2.1)	(60.3 ± 1.3)	(70.1 ± 1.7)	(69.9 ± 2.2)	(69.3 ± 2.2)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/04/84	1/04/84	1/04/84	1/17/84	1/17/84
PPB	(144 ± 4.3)	(114 ± 2.4)	(127 ± 3.0)	(135 ± 4.3)	(155 ± 5.0)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C11

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
	RTI QUALITY CONTROL**				
2nd RTI Analysis Day	58	58	58	51	51
PPB	(147 ± 4.4)	(116 ± 2.4)	(134 ± 3.2)	(17.0 ± 0.5)	(15.0 ± 0.5)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17 ± 1)**	(15 ± 1)**
3rd RTI Analysis Day	240	240	240	231	231
PPB	(146 ± 4.4)	(120 ± 2.5)	(131 ± 3.1)	(146 ± 4.7)	(152 ± 4.9)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day	401	401	401	377	377
PPB	(142 ± 4.3)	(120 ± 2.5)	(127 ± 3.0)	(136 ± 4.4)	(150 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
5th RTI Analysis Day	497	497	497	499	499
PPB	(141 ± 4.2)	(116 ± 2.4)	(129 ± 3.1)	(136 ± 4.4)	(149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(144 ± 4.3)	(119 ± 2.5)	(135 ± 3.3)	(139 ± 4.5)	(153 ± 5.0)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C12

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(75.3)	(74.4)	(75.1)	(75.6)	(70.0)
1st Analysis Date	10/31/83	10/31/83	10/31/83	11/28/83	11/28/83
PPB	(73.4)	(73.5)	(74.1)	(71.0)	(70.1)
2nd Analysis Date	12/12/83	12/12/83	12/12/83	12/13/83	12/13/83
PPB	(72.1)	(74.2)	(73.6)	(76.4)	(68.9)
RTI ANALYSIS					
1st RTI Analysis Date	1/04/84	1/04/84	1/04/84	1/17/84	1/17/84
PPB	(76.0 ± 2.3)	(70.7 ± 1.5)	(80.7 ± 1.9)	(79.0 ± 2.5)	(72.9 ± 2.3)
2nd RTI Analysis Day*	58	58	58	51	51
PPB	(77.0 ± 2.3)	(71.8 ± 1.5)	(80.4 ± 1.9)	(76.6 ± 2.5)	(72.1 ± 2.3)
3rd RTI Analysis Day*	240	240	240	231	231
PPB	(79.1 ± 2.4)	(75.3 ± 1.6)	(81.7 ± 2.0)	(82.3 ± 2.6)	(73.4 ± 2.3)
4th RTI Analysis Day*	401	401	401	377	377
PPB	(74.5 ± 2.2)	(72.6 ± 1.5)	(80.7 ± 1.9)	(79.0 ± 2.5)	(71.3 ± 2.3)
5th RTI Analysis Day*	497	497	497	499	499
PPB	(74.0 ± 2.2)	(70.9 ± 1.5)	(73.3 ± 1.8)	(74.6 ± 2.4)	(70.4 ± 2.3)
6th RTI Analysis Day*					
PPB	empty	empty	empty	empty	empty
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/04/84	1/04/84	1/04/84	1/17/84	1/17/84
PPB	(144 ± 4.3)	(114 ± 2.4)	(127 ± 3.0)	(135 ± 4.3)	(155 ± 5.0)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C12

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	58 (147 ± 4.4)	58 (116 ± 2.4)	58 (134 ± 3.2)	51 (17.0 ± 0.5)	51 (15.0 ± 0.5)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17 ± 1)**	(15 ± 1)**
3rd RTI Analysis Day PPB	240 (146 ± 4.4)	240 (120 ± 2.5)	240 (131 ± 3.1)	231 (146 ± 4.7)	231 (152 ± 4.9)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
4th RTI Analysis Day PPB	401 (142 ± 4.3)	401 (120 ± 2.5)	401 (127 ± 3.0)	377 (136 ± 4.4)	377 (150 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
5th RTI Analysis Day PPB	(141 ± 4.2)	(116 ± 2.4)	(129 ± 3.1)	(136 ± 4.4)	(149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day PPB	833 (144 ± 4.3)	833 (119 ± 2.5)	833 (135 ± 3.3)	810 (16.9 ± 0.5)	810 (14.7 ± 0.5)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C13

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(15.4)	(15.3)	(15.6)	(15.6)	(15.0)
1st Analysis Date	10/25/83	10/25/83	10/25/83	11/29/83	11/29/83
PPB	(12.4)	(13.6)	(12.7)	(10.8)	(13.6)
2nd Analysis Date	12/13/83	12/12/83	12/12/83	12/14/83	12/14/83
PPB	(11.5)	(11.9)	(11.6)	(11.3)	(14.3)
RTI ANALYSIS					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/23/84	1/23/84
PPB	(15.7 ± 0.5)	(14.6 ± 0.3)	(17.2 ± 0.4)	(16.2 ± 0.5)	(15.2 ± 0.5)
2nd RTI Analysis Day*	57	57	57	45	45
PPB	(16.2 ± 0.5)	(15.4 ± 0.3)	(17.2 ± 0.4)	(15.8 ± 0.5)	(16.1 ± 0.5)
3rd RTI Analysis Day	238	238	238	226	226
PPB	(15.7 ± 0.5)	(15.2 ± 0.3)	(15.7 ± 0.4)	(18.2 ± 0.6)	(15.4 ± 0.5)
4th RTI Analysis Day*	400	400	400	374	374
PPB	(15.2 ± 0.5)	(14.7 ± 0.3)	(16.0 ± 0.4)	(17.4 ± 0.6)	(14.4 ± 0.5)
5th RTI Analysis Day*	501	501	501	507	507
PPB	(15.4 ± 0.5)	(14.8 ± 0.3)	(15.9 ± 0.4)	(16.9 ± 0.5)	(15.4 ± 0.5)
6th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/23/84	1/23/84
PPB	(20.4 ± 0.6)	(22.8 ± 0.5)	(30.7 ± 0.7)	(17.5 ± 0.6)	(14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C13

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	57 (147 ± 4.4)	57 (116 ± 2.4)	57 (134 ± 3.2)	45 (16.8 ± 0.5)	45 (15.1 ± 0.8)
NBS Concentration** PPB	(141 ± 3)**	(120 ± 3)**	(126 ± 3)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	238 (20.3 ± 0.6)	238 (23.6 ± 0.5)	238 (28.3 ± 0.7)	226 (19.0 ± 0.6)	226 (15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day PPB	400 (20.1 ± 0.6)	400 (22.7 ± 0.5)	400 (28.5 ± 0.7)	374 (18.4 ± 0.6)	374 (14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day PPB	501 (20.0 ± 0.6)	501 (22.8 ± 0.5)	501 (28.1 ± 0.7)	507 (18.2 ± 0.6)	507 (15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day PPB	833 (144 ± 4.3)	833 (119 ± 2.5)	833 (135 ± 3.3)	810 (16.9 ± 0.5)	810 (14.7 ± 0.5)
NBS Concentration** PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C14

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(19.6)	(19.4)	(19.9)	(19.8)	(15.0)
1st Analysis Date	10/25/83	10/25/83	10/25/83	11/29/83	11/29/83
PPB	(16.2)	(15.9)	(15.7)	(13.8)	(14.0)
2nd Analysis Date	12/13/83	12/13/83	12/13/83	12/14/83	12/14/83
PPB	(15.2)	(15.2)	(14.5)	(14.5)	(14.4)
RTI ANALYSIS					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/23/84	1/23/84
PPB	(19.2 ± 0.6)	(18.4 ± 0.4)	(21.1 ± 0.5)	(20.8 ± 0.7)	(15.5 ± 0.5)
2nd RTI Analysis Day*	57	57	57	45	45
PPB	(20.0 ± 0.6)	(18.5 ± 0.4)	(21.2 ± 0.5)	(20.2 ± 0.6)	(15.6 ± 0.5)
3rd RTI Analysis Day*	238	238	238	226	226
PPB	(19.9 ± 0.6)	(19.1 ± 0.4)	(20.2 ± 0.5)	(22.0 ± 0.7)	(17.0 ± 0.5)
4th RTI Analysis Day*	400	400	400	374	374
PPB	(19.3 ± 0.6)	(18.3 ± 0.4)	(20.7 ± 0.5)	(20.6 ± 0.7)	(15.0 ± 0.5)
5th RTI Analysis Day*	501	501	501	507	507
PPB	(19.6 ± 0.6)	(18.1 ± 0.4)	(20.3 ± 0.5)	(21.2 ± 0.7)	(16.1 ± 0.5)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(24.2 ± 0.7)	(21.6 ± 0.5)	(24.5 ± 0.6)	(21.7 ± 0.7)	(16.7 ± 0.5)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/23/84	1/23/84
PPB	(20.4 ± 0.6)	(22.8 ± 0.5)	(30.7 ± 0.7)	(17.5 ± 0.6)	(14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C14

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	57	57	57	45	45
PPB	(147 ± 4.4)	(116 ± 2.4)	(134 ± 3.2)	(16.8 ± 0.5)	(15.1 ± 0.8)
NBS Concentration** PPB	(141 ± 3)**	(120 ± 3)**	(126 ± 3)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	238	238	238	226	226
PPB	(20.3 ± 0.6)	(23.6 ± 0.5)	(28.3 ± 0.7)	(19.0 ± 0.6)	(15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	400	400	400	374	374
PPB	(20.1 ± 0.6)	(22.7 ± 0.5)	(28.5 ± 0.7)	(18.4 ± 0.6)	(14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	501	501	501	507	507
PPB	(20.0 ± 0.6)	(22.8 ± 0.5)	(28.1 ± 0.7)	(18.2 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day	833	833	833	810	810
PPB	(144 ± 4.3)	(119 ± 2.5)	(135 ± 3.3)	(16.9 ± 0.5)	(14.7 ± 0.5)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C15

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(18.1)	(17.9)	(18.3)	(18.3)	(15.0)
1st Analysis Date PPB	10/25/83 (14.0)	10/25/83 (14.3)	10/25/83 (13.8)	11/29/83 (11.9)	11/29/83 (13.8)
2nd Analysis Date PPB	12/13/83 (12.9)	12/13/83 (13.0)	12/13/83 (12.6)	12/14/83 (12.7)	12/14/83 (14.2)
RTI ANALYSIS					
1st RTI Analysis Date PPB	1/05/84 (17.2 ± 0.5)	1/05/84 (16.2 ± 0.3)	1/05/84 (19.3 ± 0.5)	1/23/84 (18.1 ± 0.6)	1/23/84 (14.9 ± 0.5)
2nd RTI Analysis Day* PPB	57 (17.2 ± 0.5)	57 (16.7 ± 0.4)	57 (19.4 ± 0.5)	45 (17.5 ± 0.6)	45 (14.8 ± 0.5)
3rd RTI Analysis Day* PPB	238 (17.6 ± 0.5)	238 (17.0 ± 0.4)	238 (17.9 ± 0.4)	226 (19.8 ± 0.6)	226 (15.6 ± 0.5)
4th RTI Analysis Day* PPB	400 (17.0 ± 0.5)	400 (16.4 ± 0.3)	400 (18.3 ± 0.4)	374 (18.8 ± 0.6)	374 (14.9 ± 0.5)
5th RTI Analysis Day* PPB	501 (15.9 ± 0.5)	501 (16.4 ± 0.3)	501 (17.4 ± 0.4)	507 (18.6 ± 0.6)	507 (15.4 ± 0.5)
6th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	1/05/84 (20.4 ± 0.6)	1/05/84 (22.8 ± 0.5)	1/05/84 (30.7 ± 0.7)	1/23/84 (17.5 ± 0.6)	1/23/84 (14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C15

ACTIVITY	COMPOUND				
	Carbon tetra-chloride	Chloroform	Perchloro-ethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	57 (147 ± 4.4)	57 (116 ± 2.4)	57 (134 ± 3.2)	45 (16.8 ± 0.5)	45 (15.1 ± 0.8)
NBS Concentration** PPB	(141 ± 3)**	(120 ± 3)**	(126 ± 3)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	238 (20.3 ± 0.6)	238 (23.6 ± 0.5)	238 (28.3 ± 0.7)	226 (19.0 ± 0.6)	226 (15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day PPB	400 (20.1 ± 0.6)	400 (22.7 ± 0.5)	400 (28.5 ± 0.7)	374 (18.4 ± 0.6)	374 (14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day PPB	501 (20.0 ± 0.6)	501 (22.8 ± 0.5)	501 (28.1 ± 0.7)	507 (18.2 ± 0.6)	507 (15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day PPB	833 (144 ± 4.3)	833 (119 ± 2.5)	833 (135 ± 3.3)	810 (16.9 ± 0.5)	810 (14.7 ± 0.5)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-C16

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(20.9)	(20.7)	(21.2)	(21.2)	(15.0)
1st Analysis Date	11/11/83	11/11/83	11/11/83	11/29/83	11/29/83
PPB	(15.6)	(11.1)	(12.5)	(9.1)	(13.9)
2nd Analysis Date	12/13/83	12/13/83	12/13/83	12/14/83	12/14/83
PPB	(14.2)	(8.1)	(11.7)	(9.4)	(13.8)
RTI ANALYSIS					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/23/84	1/23/84
PPB	(17.9 ± 0.5)	(9.0 ± 0.2)	(16.5 ± 0.4)	(13.8 ± 0.4)	(14.9 ± 0.5)
2nd RTI Analysis Day*	57	57	57	45	45
PPB	(17.4 ± 0.5)	(7.9 ± 0.2)	(15.4 ± 0.4)	(13.2 ± 0.4)	(14.8 ± 0.5)
3rd RTI Analysis Day*	238	238	238	226	226
PPB	(16.2 ± 0.5)	(6.0 ± 0.1)	(14.6 ± 0.4)	(14.6 ± 0.5)	(15.8 ± 0.5)
4th RTI Analysis Day*	400	400	400	374	374
PPB	(14.9 ± 0.4)	(4.8 ± 0.1)	(14.6 ± 0.4)	(13.6 ± 0.4)	(12.3 ± 0.4)
5th RTI Analysis Day*	501	501	501	507	507
PPB	(14.5 ± 0.4)	(3.7 ± 0.1)	(14.2 ± 0.3)	(12.2 ± 0.4)	(11.6 ± 0.4)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(15.4 ± 0.5)	(3.2 ± 0.1)	(16.1 ± 0.4)	(12.7 ± 0.4)	(13.2 ± 0.4)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/23/84	1/23/84
PPB	(20.4 ± 0.6)	(22.8 ± 0.5)	(30.7 ± 0.7)	(17.5 ± 0.6)	(14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-C16

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
			RTI QUALITY CONTROL**		
2nd RTI Analysis Day PPB	57 (147 ± 4.4)	57 (116 ± 2.4)	57 (134 ± 3.2)	45 (16.8 ± 0.5)	45 (15.1 ± 0.8)
NBS Concentration** PPB	(141 ± 3)**	(120 ± 3)**	(126 ± 3)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	238 (20.3 ± 0.6)	238 (23.6 ± 0.5)	238 (28.3 ± 0.7)	226 (19.0 ± 0.6)	226 (15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 1)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day PPB	400 (20.1 ± 0.6)	400 (22.7 ± 0.5)	400 (28.3 ± 0.7)	374 (18.4 ± 0.6)	374 (14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day PPB	501 (20.0 ± 0.6)	501 (22.8 ± 0.5)	501 (28.1 ± 0.7)	507 (18.2 ± 0.6)	507 (15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day PPB	833 (144 ± 4.3)	833 (119 ± 2.5)	833 (135 ± 3.3)	810 (16.9 ± 0.5)	810 (14.7 ± 0.5)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A1

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(9.7)	(40.5)	(9.6)	(19.3)	(20.0)
1st Analysis Date	11/16/83	11/16/83	11/16/83	12/06/83	12/06/83
PPB	(8.3)	(42.9)	(10.2)	(16.0)	(18.8)
2nd Analysis Date	12/16/83	12/16/83	12/16/83	12/15/83	12/15/83
PPB	(7.3)	(41.6)	(7.3)	(16.8)	(19.2)
RTI ANALYSIS					
1st RTI Analysis Date	1/06/84	1/06/84	1/06/84	1/23/84	1/23/84
PPB	(9.8 ± 0.3)	(40.4 ± 0.8)	(10.8 ± 0.3)	(19.6 ± 0.6)	(20.3 ± 0.6)
2nd RTI Analysis Day*	59	59	59	49	49
PPB	(9.9 ± 0.3)	(42.0 ± 0.9)	(9.6 ± 0.2)	(20.0 ± 0.6)	(19.8 ± 0.6)
3rd RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
4th RTI Analysis Day*	404	404	404	375	375
PPB	(9.9 ± 0.3)	(37.6 ± 0.8)	(9.1 ± 0.2)	(19.4 ± 0.6)	(20.2 ± 0.6)
5th RTI Analysis Day*	497	497	497	508	508
PPB	(9.5 ± 0.3)	(37.3 ± 0.8)	(10.0 ± 0.2)	(19.7 ± 0.6)	(20.6 ± 0.7)
6th RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/06/84	1/06/84	1/06/84	1/23/84	1/23/84
PPB	(20.6 ± 0.6)	(22.8 ± 0.5)	(31.7 ± 0.8)	(17.5 ± 0.6)	(14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A1

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	59	59	59	49	49
PPB	(20.3 ± 0.6)	(8.9 ± 0.2)	(23.6 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration** PPB	(19 ± 1)**	(9 ± 1)**	(22 ± 1)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	238	238	238	226	226
PPB	(21.1 ± 0.6)	(24.3 ± 0.5)	(29.5 ± 0.7)	(19.0 ± 0.6)	(15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	404	404	404	375	375
PPB	(20.6 ± 0.6)	(23.2 ± 0.5)	(28.7 ± 0.7)	(18.1 ± 0.6)	(14.1 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	497	497	497	508	508
PPB	(19.9 ± 0.6)	(22.9 ± 0.5)	(28.8 ± 0.7)	(18.5 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(16.9 ± 0.5)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A2

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(9.5)	(39.6)	(9.4)	(18.9)	(20.0)
1st Analysis Date	11/17/83	11/17/83	11/17/83	12/06/83	12/06/83
PPB	(7.7)	(42.1)	(9.2)	(15.8)	(18.3)
2nd Analysis Date	12/16/83	12/16/83	12/16/83	12/15/83	12/15/83
PPB	(7.1)	(41.2)	(7.7)	(19.6)	(19.2)
RTI ANALYSIS					
1st RTI Analysis Date	1/06/84	1/06/84	1/06/84	1/23/84	1/23/84
PPB	(9.3 ± 0.3)	(40.0 ± 0.8)	(9.4 ± 0.2)	(19.6 ± 0.6)	(20.2 ± 0.6)
2nd RTI Analysis Day*	59	59	59	49	49
PPB	(9.3 ± 0.3)	(38.7 ± 0.8)	(10.3 ± 0.2)	(20.0 ± 0.6)	(19.0 ± 0.6)
3rd RTI Analysis Day*	238	238	238	226	226
PPB	(9.5 ± 0.3)	(40.6 ± 0.9)	(9.5 ± 0.2)	(19.4 ± 0.6)	(20.6 ± 0.7)
4th RTI Analysis Day*	404	404	404	375	375
PPB	(9.6 ± 0.3)	(37.1 ± 0.8)	(9.1 ± 0.2)	(19.4 ± 0.6)	(20.4 ± 0.7)
5th RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
6th RTI Analysis Day*	833	833	833	810	810
PPB	(10.5 ± 0.3)	(40.5 ± 0.9)	(11.2 ± 3)	(19.7 ± 0.6)	(19.4 ± 0.6)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/06/84	1/06/84	1/06/84	1/23/84	1/23/84
PPB	(20.6 ± 0.6)	(22.8 ± 0.5)	(31.7 ± 0.8)	(17.5 ± 0.6)	(14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A2

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	59	59	59	49	49
PPB	(20.3 ± 0.6)	(8.9 ± 0.2)	(23.6 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration** PPB	(19 ± 1)**	(9 ± 1)**	(22 ± 1)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	238	238	238	226	226
PPB	(21.1 ± 0.6)	(24.3 ± 0.5)	(29.5 ± 0.7)	(19.0 ± 0.6)	(15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	404	404	404	375	375
PPB	(20.6 ± 0.6)	(23.2 ± 0.5)	(28.7 ± 0.7)	(18.1 ± 0.6)	(14.1 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	497	497	497	508	508
PPB	(19.9 ± 0.6)	(22.9 ± 0.5)	(28.8 ± 0.7)	(18.5 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(16.9 ± 0.5)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A3

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(11.4)	(47.3)	(11.2)	(22.5)	(20.0)
1st Analysis Date	12/09/83	12/09/83	12/09/83	12/07/83	12/07/83
PPB	(9.5)	(47.2)	(9.4)	(18.7)	(15.8)
2nd Analysis Date	12/16/83	12/16/83	12/16/83	12/15/83	12/15/83
PPB	(8.9)	(48.7)	(8.6)	(20.3)	(19.4)
RTI ANALYSIS					
1st RTI Analysis Date	1/06/84	1/06/84	1/06/84	1/23/84	1/23/84
PPB	(11.5 ± 0.3)	(46.6 ± 1.0)	(12.0 ± 0.3)	(23.2 ± 0.7)	(20.3 ± 0.6)
2nd RTI Analysis Day*	59	59	59	49	49
PPB	(11.0 ± 0.3)	(47.4 ± 1.0)	(11.3 ± 0.3)	(25.2 ± 0.8)	(19.8 ± 0.6)
3rd RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
4th RTI Analysis Day*	404	404	404	375	375
PPB	(11.4 ± 0.3)	(43.9 ± 0.9)	(10.3 ± 0.2)	(23.0 ± 0.7)	(20.5 ± 0.7)
5th RTI Analysis Day*	497	497	497		
PPB	(11.0 ± 0.3)	(43.6 ± 0.9)	(11.6 ± 0.3)	on audit	on audit
6th RTI Analysis Day*	833	833	833	810	810
PPB	(12.3 ± 0.4)	(48.3 ± 1.0)	(13.3 ± 0.3)	(24.6 ± 0.8)	(21.1 ± 0.7)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/06/84	1/06/84	1/06/84	1/23/84	1/23/84
PPB	(20.6 ± 0.6)	(22.8 ± 0.5)	(31.7 ± 0.8)	(17.5 ± 0.6)	(14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A3

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	59 (20.3 ± 0.6)	59 (8.9 ± 0.2)	59 (23.6 ± 0.6)	49 (18.6 ± 0.6)	49 (15.0 ± 0.5)
NBS Concentration** PPB	(19 ± 1)**	(9 ± 1)**	(22 ± 1)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	238 (21.1 ± 0.6)	238 (24.3 ± 0.5)	238 (29.5 ± 0.7)	226 (19.0 ± 0.6)	226 (15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day PPB	404 (20.6 ± 0.6)	404 (23.2 ± 0.5)	404 (28.7 ± 0.7)	375 (18.1 ± 0.6)	375 (14.1 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day PPB	497 (19.9 ± 0.6)	497 (22.9 ± 0.5)	497 (28.8 ± 0.7)	508 (18.5 ± 0.6)	508 (15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day PPB	833 (22.4 ± 0.7)	833 (25.5 ± 0.5)	833 (32.7 ± 0.8)	810 (16.9 ± 0.5)	810 (14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A4

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
			MANUFACTURER ANALYSIS		
Theoretical PPB	(10.9)	(45.3)	(10.8)	(21.5)	(20.0)
1st Analysis Date PPB	12/09/83 (9.0)	12/09/83 (46.5)	12/09/83 (9.6)	12/07/83 (18.6)	12/07/83 (18.3)
2nd Analysis Date PPB	12/16/83 (8.6)	12/16/83 (51.1)	12/16/83 (10.1)	12/15/83 (19.5)	12/15/83 (19.2)
			RTI ANALYSIS		
1st RTI Analysis Date PPB	1/09/84 (11.0 ± 0.3)	1/09/84 (45.0 ± 0.9)	1/09/84 (12.0 ± 0.3)	1/23/84 (22.3 ± 0.7)	1/23/84 (20.5 ± 0.7)
2nd RTI Analysis Day* PPB	59 on audit	59 on audit	59 on audit	59 on audit	59 on audit
3rd RTI Analysis Day* PPB	238 (10.8 ± 0.3)	238 (47.1 ± 1.0)	238 (10.3 ± 0.2)	226 (23.2 ± 0.7)	226 (20.1 ± 0.6)
4th RTI Analysis Day* PPB	404 (11.4 ± 0.3)	404 (43.9 ± 0.9)	404 (10.3 ± 0.2)	375 (19.9 ± 0.6)	375 (22.1 ± 0.7)
5th RTI Analysis Day* PPB	on audit	on audit	on audit	508 (22.3 ± 0.7)	508 (19.8 ± 0.6)
6th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
			RTI QUALITY CONTROL**		
1st RTI Analysis Date PPB	1/06/84 (20.6 ± 0.6)	1/06/84 (22.8 ± 0.5)	1/06/84 (31.7 ± 0.8)	1/23/84 (17.5 ± 0.6)	1/23/84 (14.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A4

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	59	59	59	49	49
PPB	(20.3 ± 0.6)	(8.9 ± 0.2)	(23.6 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration** PPB	(19 ± 1)**	(9 ± 1)**	(22 ± 1)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	238	238	238	226	226
PPB	(21.1 ± 0.6)	(24.3 ± 0.5)	(29.5 ± 0.7)	(19.0 ± 0.6)	(15.3 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	404	404	404	375	375
PPB	(20.6 ± 0.6)	(23.2 ± 0.5)	(28.7 ± 0.7)	(18.1 ± 0.6)	(14.1 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	497	497	497	508	508
PPB	(19.9 ± 0.6)	(22.9 ± 0.5)	(28.8 ± 0.7)	(18.5 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(16.9 ± 0.5)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A5

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(48.4)	(10.6)	(10.6)	(48.4)	(50.0)
1st Analysis Date PPB	12/09/83 (46.6)	12/09/83 (9.7)	12/09/83 (9.5)	12/07/83 (45.1)	12/07/83 (47.5)
2nd Analysis Date PPB	12/20/83 (47.8)	12/20/83 (9.0)	12/20/83 (8.7)	12/15/83 (46.0)	12/15/83 (49.8)
RTI ANALYSIS					
1st RTI Analysis Date PPB	1/09/84 (47.7 ± 1.4)	1/09/84 (10.5 ± 0.2)	1/09/84 (11.2 ± 0.3)	1/19/84 (51.6 ± 1.7)	1/19/84 (53.0 ± 1.7)
2nd RTI Analysis Day* PPB	57 (51.1 ± 1.5)	57 (9.3 ± 0.2)	57 (9.0 ± 0.2)	53 (52.0 ± 1.7)	53 (50.0 ± 1.6)
3rd RTI Analysis Day* PPB	235 (50.9 ± 1.5)	235 (10.5 ± 0.2)	235 (10.5 ± 0.3)	229 (54.0 ± 1.7)	229 (52.8 ± 1.7)
4th RTI Analysis Day* PPB	402 (47.2 ± 1.4)	402 (10.2 ± 0.2)	402 (10.4 ± 0.2)	375 (53.8 ± 1.7)	375 (50.8 ± 1.6)
5th RTI Analysis Day* PPB	494 (46.0 ± 1.4)	494 (10.3 ± 0.2)	494 (10.7 ± 0.3)	497 (49.0 ± 1.6)	497 (50.1 ± 1.6)
6th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	1/09/84 (18.9 ± 0.6)	1/09/84 (9.4 ± 0.2)	1/09/84 (24.4 ± 0.6)	1/19/84 (20.2 ± 0.6)	1/19/84 (16.3 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A5

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	57	57	57	53	53
PPB	(21.5 ± 0.6)	(10.1 ± 0.2)	(26.1 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	235	235	235	229	229
PPB	(21.1 ± 0.6)	(24.3 ± 0.5)	(29.5 ± 0.7)	(19.0 ± 0.6)	(15.3 ± 0.5)
NBS Concentration** PPB	(21 ± 1)**	(23 ± 1)**	(29 ± 2)**	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	402	402	402	375	375
PPB	(18.9 ± 0.6)	(9.2 ± 0.2)	(21.9 ± 0.5)	(17.8 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	494	494	494	497	497
PPB	(19.9 ± 0.6)	(22.9 ± 0.5)	(28.8 ± 0.7)	(18.5 ± 0.6)	(29.4 ± 0.9)
NBS Concentration** PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(18 ± 1)	(31 ± 2)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(16.9 ± 0.5)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A6

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(38.8)	(8.5)	(8.5)	(38.8)	(50.0)
1st Analysis Date	12/09/83	12/09/83	12/09/83	12/07/83	12/07/83
PPB	(38.0)	(6.9)	(8.8)	(35.0)	(47.1)
2nd Analysis Date	12/20/83	12/20/83	12/20/83	12/15/83	12/15/83
PPB	(37.5)	(6.7)	(8.1)	(34.5)	(49.3)
RTI ANALYSIS					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/19/84	1/19/84
PPB	(38.6 ± 1.2)	(8.2 ± 0.2)	(8.5 ± 0.2)	(41.9 ± 1.3)	(53.0 ± 1.7)
2nd RTI Analysis Day*	57	57	57	53	53
PPB	(41.0 ± 1.2)	(7.3 ± 0.2)	(7.9 ± 0.2)	(41.1 ± 1.3)	(49.8 ± 1.6)
3rd RTI Analysis Day*	235	235	235	229	229
PPB	(40.4 ± 1.2)	(8.2 ± 0.2)	(8.2 ± 0.2)	(43.1 ± 1.4)	(51.9 ± 1.7)
4th RTI Analysis Day*	402	402	402	375	375
PPB	(37.7 ± 1.1)	(8.3 ± 0.2)	(8.4 ± 0.2)	(40.7 ± 1.3)	(50.8 ± 1.6)
5th RTI Analysis Day*	494	494	494	497	497
PPB	(37.2 ± 1.1)	(8.1 ± 0.2)	(9.0 ± 0.2)	(39.1 ± 1.3)	(50.3 ± 1.6)
6th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/19/84	1/19/84
PPB	(18.9 ± 0.6)	(9.4 ± 0.2)	(24.4 ± 0.6)	(20.2 ± 0.6)	(16.3 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A6

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
	RTI QUALITY CONTROL**				
2nd RTI Analysis Day PPB	57 (21.5 ± 0.6)	57 (10.1 ± 0.2)	57 (26.1 ± 0.6)	53 (18.6 ± 0.6)	53 (15.0 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	235 (21.1 ± 0.6)	235 (24.3 ± 0.5)	235 (29.5 ± 0.7)	229 (19.0 ± 0.6)	229 (15.3 ± 0.5)
NBS Concentration** PPB	(21 ± 1)**	(23 ± 1)**	(29 ± 2)**	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day PPB	402 (18.9 ± 0.6)	402 (9.2 ± 0.2)	402 (21.9 ± 0.5)	375 (17.8 ± 0.6)	375 (14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day PPB	494 (19.9 ± 0.6)	494 (22.9 ± 0.5)	494 (28.8 ± 0.7)	497 (18.5 ± 0.6)	497 (29.4 ± 0.9)
NBS Concentration** PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(18 ± 1)	(31 ± 2)
6th RTI Analysis Day PPB	833 (22.4 ± 0.7)	833 (25.5 ± 0.5)	833 (32.7 ± 0.8)	810 (16.9 ± 0.5)	810 (14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A7

ACTIVITY		COMPOUND				
		Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS						
Theoretical	PPB	(51.1)	(11.2)	(11.2)	(51.1)	(50.0)
1st Analysis	Date	12/09/83	12/09/83	12/09/83	12/07/83	12/07/83
	PPB	(49.2)	(10.4)	(10.4)	(47.1)	(48.6)
2nd Analysis	Date	12/20/83	12/20/83	12/20/83	12/15/83	12/15/83
	PPB	(49.9)	(9.5)	(9.3)	(48.5)	(48.5)
RTI ANALYSIS						
1st RTI Analysis	Date	1/09/84	1/09/84	1/09/84	1/19/84	1/19/84
	PPB	(49.2 ± 1.5)	(11.1 ± 0.2)	(11.8 ± 0.3)	(54.1 ± 1.7)	(53.4 ± 1.7)
2nd RTI Analysis	Day*	57	57	57	53	53
	PPB	(54.0 ± 1.6)	(9.7 ± 0.2)	(9.7 ± 0.2)	(54.8 ± 1.8)	(49.7 ± 1.6)
3rd RTI Analysis	Day*	235	235	235	229	229
	PPB	(53.3 ± 1.6)	(11.0 ± 0.2)	(11.2 ± 0.3)	(56.2 ± 1.8)	(51.9 ± 1.7)
4th RTI Analysis	Day*	402	402	402	375	375
	PPB	(49.6 ± 1.5)	(10.7 ± 0.2)	(11.1 ± 0.3)	(53.8 ± 1.7)	(50.8 ± 1.6)
5th RTI Analysis	Day*	494	494	494	497	497
	PPB	(47.8 ± 1.5)	(10.8 ± 0.2)	(11.7 ± 0.3)	(52.3 ± 1.7)	(50.4 ± 1.6)
6th RTI Analysis	Day*	833	833	833	810	810
	PPB	(54.5 ± 1.6)	(12.2 ± 0.3)	(13.6 ± 0.3)	(49.0 ± 1.6)	(45.8 ± 1.5)
RTI QUALITY CONTROL**						
1st RTI Analysis	Date	1/09/84	1/09/84	1/09/84	1/19/84	1/19/84
	PPB	(18.9 ± 0.6)	(9.4 ± 0.2)	(24.4 ± 0.6)	(20.2 ± 0.6)	(16.3 ± 0.5)
NBS Concentration	PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A7

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
			RTI QUALITY CONTROL**		
2nd RTI Analysis Day PPB	57 (21.5 ± 0.6)	57 (10.1 ± 0.2)	57 (26.1 ± 0.6)	53 (18.6 ± 0.6)	53 (15.0 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	235 (21.1 ± 0.6)	235 (24.3 ± 0.5)	235 (29.5 ± 0.7)	229 (19.0 ± 0.6)	229 (15.3 ± 0.5)
NBS Concentration** PPB	(21 ± 1)**	(23 ± 1)**	(29 ± 2)**	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day PPB	402 (18.9 ± 0.6)	402 (9.2 ± 0.2)	402 (21.9 ± 0.5)	375 (17.8 ± 0.6)	375 (14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day PPB	494 (19.9 ± 0.6)	494 (22.9 ± 0.5)	494 (28.8 ± 0.7)	497 (18.5 ± 0.6)	497 (29.4 ± 0.9)
NBS Concentration** PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(18 ± 1)	(31 ± 2)
6th RTI Analysis Day PPB	833 (22.4 ± 0.7)	833 (25.5 ± 0.5)	833 (32.7 ± 0.8)	810 (16.9 ± 0.5)	810 (14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A8

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(55.1)	(12.1)	(12.1)	(55.1)	—
1st Analysis Date	12/09/83	12/09/83	12/09/83	12/07/83	12/07/83
PPB	(52.6)	(7.9)	(10.5)	(42.7)	(48.4)
2nd Analysis Date	12/20/83	12/20/83	12/20/83	12/15/83	12/15/83
PPB	(53.2)	(6.3)	(9.5)	(43.9)	(48.3)
RTI ANALYSIS					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/19/84	1/19/84
PPB	(53.5 ± 2.7)	(7.4 ± 0.2)	(11.3 ± 0.3)	(48.3 ± 1.5)	(51.7 ± 1.7)
2nd RTI Analysis Day*	57	57	57	53	53
PPB	(59.0 ± 1.8)	(6.0 ± 0.1)	(10.5 ± 0.3)	(48.1 ± 1.5)	(49.2 ± 1.6)
3rd RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
4th RTI Analysis Day*	402	402	402	375	375
PPB	(51.3 ± 1.5)	(4.3 ± 0.1)	(10.3 ± 0.2)	(46.3 ± 1.5)	(49.0 ± 1.6)
5th RTI Analysis Day*	494	494	494	497	497
PPB	(50.1 ± 1.5)	(4.1 ± 0.1)	(11.4 ± 0.3)	(44.2 ± 1.4)	(48.5 ± 1.6)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(56.9 ± 1.7)	(3.9 ± 0.1)	(13.3 ± 0.3)	(43.4 ± 1.4)	(45.8 ± 1.5)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/19/84	1/19/84
PPB	(18.9 ± 0.6)	(9.4 ± 0.2)	(24.4 ± 0.6)	(20.2 ± 0.6)	(16.3 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A8

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	57	57	57	53	53
PPB	(21.5 ± 0.6)	(10.1 ± 0.2)	(26.1 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	235	235	235	229	229
PPB	(21.1 ± 0.6)	(24.3 ± 0.5)	(29.5 ± 0.7)	(19.0 ± 0.6)	(15.3 ± 0.5)
NBS Concentration** PPB	(21 ± 1)**	(23 ± 1)**	(29 ± 2)**	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	402	402	402	375	375
PPB	(18.9 ± 0.6)	(9.2 ± 0.2)	(21.9 ± 0.5)	(17.8 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	494	494	494	497	497
PPB	(19.9 ± 0.6)	(22.9 ± 0.5)	(28.8 ± 0.7)	(18.5 ± 0.6)	(29.4 ± 0.9)
NBS Concentration** PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(18 ± 1)	(31 ± 2)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(16.9 ± 0.5)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A9

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(13.6)	(13.4)	(68.4)	(48.3)	(30.0)
1st Analysis Date	12/08/83	12/08/83	12/08/83	12/09/83	12/09/83
PPB	(11.1)	(11.3)	(63.5)	(41.8)	(29.0)
2nd Analysis Date	12/19/83	12/19/83	12/19/83	12/16/83	12/16/83
PPB	(11.8)	(11.4)	(63.8)	(43.9)	(28.5)
RTI ANALYSIS					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(13.0 ± 2.7)	(11.9 ± 0.2)	(69.6 ± 1.7)	(46.8 ± 1.5)	(31.1 ± 1.0)
2nd RTI Analysis Day*	60	60	60	52	52
PPB	(11.8 ± 0.4)	(10.5 ± 0.2)	(67.6 ± 1.6)	(46.4 ± 1.5)	(29.3 ± 0.9)
3rd RTI Analysis Day*	238	238	238	228	228
PPB	(12.7 ± 0.4)	(12.3 ± 0.3)	(62.2 ± 1.5)	(48.0 ± 1.5)	(31.3 ± 1.0)
4th RTI Analysis Day*	407	407	407	374	374
PPB	(12.5 ± 0.4)	(11.8 ± 0.2)	(63.7 ± 1.5)	(45.8 ± 1.5)	(29.9 ± 1.0)
5th RTI Analysis Day*					
PPB	(12.0 ± 0.4)	(12.0 ± 0.3)	(64.3 ± 1.5)	(44.7 ± 1.4)	(29.0 ± 0.9)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(13.7 ± 0.4)	(13.3 ± 0.3)	(69.9 ± 1.7)	(46.6 ± 1.5)	(31.3 ± 1.0)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(20.4 ± 0.6)	(22.8 ± 0.5)	(30.7 ± 0.7)	(18.4 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A9

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	60	60	60	52	52
PPB	(20.3 ± 0.6)	(8.9 ± 0.2)	(23.6 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration** PPB	(19 ± 1)**	(9 ± 1)**	(22 ± 1)**	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	238	238	238	228	228
PPB	(20.3 ± 0.6)	(23.6 ± 0.5)	(28.3 ± 0.7)	(19.0 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	407	407	407	374	374
PPB	(20.7 ± 0.6)	(23.3 ± 0.5)	(29.0 ± 0.7)	(17.8 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	496	496	496	504	504
PPB	(20.3 ± 0.6)	(23.4 ± 0.5)	(30.6 ± 0.7)	(18.6 ± 0.6)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(18.9 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A10

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(13.3)	(13.1)	(67.0)	(47.3)	(30.0)
1st Analysis Date	12/08/83	12/08/83	12/08/83	12/09/83	12/09/83
PPB	(11.1)	(11.8)	(75.1)	(41.0)	(28.9)
2nd Analysis Date	12/19/83	12/19/83	12/19/83	12/16/83	12/16/83
PPB	(11.8)	(11.1)	(64.1)	(43.3)	(28.3)
RTI ANALYSIS					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(12.6 ± 2.7)	(11.6 ± 0.2)	(68.6 ± 1.6)	(46.1 ± 1.5)	(31.6 ± 1.0)
2nd RTI Analysis Day*	60	60	60	52	52
PPB	(11.6 ± 0.3)	(10.2 ± 0.2)	(67.7 ± 1.6)	(45.2 ± 1.4)	(29.8 ± 1.0)
3rd RTI Analysis Day*	238	238	238	228	228
PPB	(12.5 ± 0.4)	(12.2 ± 0.3)	(62.2 ± 1.5)	(47.3 ± 1.5)	(32.0 ± 1.0)
4th RTI Analysis Day*	407	407	407	374	374
PPB	(12.5 ± 0.4)	(11.7 ± 0.2)	(62.1 ± 1.5)	(45.4 ± 1.5)	(30.4 ± 1.0)
5th RTI Analysis Day*	496	496	496	504	504
PPB	(12.3 ± 0.4)	(12.2 ± 0.3)	(65.1 ± 1.6)	(43.9 ± 1.4)	(29.9 ± 1.0)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(14.4 ± 0.4)	(14.4 ± 0.3)	(70.1 ± 1.7)	(45.7 ± 1.5)	(31.3 ± 1.0)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(20.4 ± 0.6)	(22.8 ± 0.5)	(30.7 ± 0.7)	(18.4 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A10

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	60	60	60	52	52
PPB	(20.3 ± 0.6)	(8.9 ± 0.2)	(23.6 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day	238	238	238	228	228
PPB	(20.3 ± 0.6)	(23.6 ± 0.5)	(28.3 ± 0.7)	(19.0 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	407	407	407	374	374
PPB	(20.7 ± 0.6)	(23.6 ± 0.5)	(28.3 ± 0.7)	(19.0 ± 0.6)	(14.8 ± 0.5)
NBS Concentration** PPB	(19 ± 1)**	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	496	496	496	504	504
PPB	(20.3 ± 0.6)	(23.4 ± 0.5)	(30.6 ± 0.7)	(18.6 ± 0.6)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(18.9 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A11

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(11.7)	(11.5)	(59.0)	(41.6)	(30.0)
1st Analysis Date	12/08/83	12/08/83	12/08/83	12/09/83	12/09/83
PPB	(5.7)	(7.3)	(25.9)	(22.1)	(28.5)
2nd Analysis Date	12/19/83	12/19/83	12/19/83	12/16/83	12/16/83
PPB	(6.7)	(6.2)	(20.6)	(23.2)	(28.6)
RTI ANALYSIS					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(7.8 ± 2.7)	(7.8 ± 0.2)	(22.8 ± 0.5)	(26.2 ± 0.8)	(31.4 ± 1.0)
2nd RTI Analysis Day*	60	60	60	52	52
PPB	(6.6 ± 0.2)	(7.4 ± 0.2)	(21.9 ± 0.5)	(26.0 ± 0.8)	(29.6 ± 0.9)
3rd RTI Analysis Day*	238	238	238	228	228
PPB	(7.1 ± 0.2)	(8.1 ± 0.2)	(21.1 ± 0.5)	(29.9 ± 1.0)	(32.0 ± 1.0)
4th RTI Analysis Day*	407	407	407	374	374
PPB	(7.0 ± 0.2)	(7.8 ± 0.2)	(21.5 ± 0.5)	(29.8 ± 1.0)	(32.0 ± 1.0)
5th RTI Analysis Day*	496	496	496	504	504
PPB	(6.4 ± 0.2)	(7.9 ± 0.2)	(21.1 ± 0.5)	(25.9 ± 0.8)	(30.1 ± 1.0)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(8.0 ± 0.2)	(9.4 ± 0.2)	(24.4 ± 0.6)	(26.5 ± 0.7)	(32.1 ± 1.0)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(20.4 ± 0.6)	(22.8 ± 0.5)	(30.7 ± 0.7)	(18.4 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A11

ACTIVITY	COMPOUND				
	Carbon Tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	60	60	60	52	52
PPB	(20.3 ± 0.6)	(8.9 ± 0.2)	(23.6 ± 0.6)	(18.6 ± 0.6)	(15.0 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
3th RTI Analysis Day	238	238	238	238	238
PPB	(20.3 ± 0.6)	(23.6 ± 0.5)	(28.3 ± 0.7)	(19.0 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day	407	407	407	374	374
PPB	(20.7 ± 0.6)	(23.3 ± 0.5)	(29.0 ± 0.7)	(17.8 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day	496	496	496	504	504
PPB	(20.0 ± 0.6)	(22.8 ± 0.5)	(28.1 ± 0.7)	(18.6 ± 0.6)	(14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day	833	833	833	810	810
PPB	(22.4 ± 0.7)	(25.5 ± 0.5)	(32.7 ± 0.8)	(18.9 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A12

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(14.3)	(14.0)	(71.8)	(50.7)	(30.0)
1st Analysis Date	12/08/83	12/08/83	12/08/83	12/09/83	12/09/83
PPB	(12.7)	(13.2)	(70.9)	(46.5)	(28.1)
2nd Analysis Date	12/19/83	12/19/83	12/19/83	12/16/83	12/16/83
PPB	(12.6)	(12.9)	(68.3)	(48.9)	(28.5)
RTI ANALYSIS					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(14.2 ± 2.7)	(13.0 ± 0.3)	(74.3 ± 1.8)	(51.9 ± 1.7)	(31.1 ± 1.0)
2nd RTI Analysis Day*	60	60	60	52	52
PPB	(13.4 ± 0.4)	(12.4 ± 0.3)	(75.6 ± 1.8)	(51.2 ± 1.6)	(29.6 ± 0.9)
3rd RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
4th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
5th RTI Analysis Day* PPB	on audit	on audit	on audit	on audit	on audit
6th RTI Analysis Day*	833	833	833	810	810
PPB	(16.9 ± 0.5)	(15.3 ± 0.4)	(78.0 ± 1.9)	(52.6 ± 1.7)	(31.8 ± 1.0)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/05/84	1/05/84	1/05/84	1/20/84	1/20/84
PPB	(20.4 ± 0.6)	(22.8 ± 0.5)	(30.7 ± 0.7)	(18.4 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A12

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	60 (20.3 ± 0.6)	60 (8.9 ± 0.2)	60 (23.6 ± 0.6)	52 (18.6 ± 0.6)	52 (15.0 ± 0.5)
NBS Concentration** PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
3rd RTI Analysis Day PPB	238 (20.3 ± 0.6)	238 (23.6 ± 0.5)	238 (28.3 ± 0.7)	228 (19.0 ± 0.6)	228 (14.8 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
4th RTI Analysis Day PPB	407 (20.7 ± 0.6)	407 (23.3 ± 0.5)	407 (29.0 ± 0.7)	374 (17.8 ± 0.6)	374 (14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)
5th RTI Analysis Day PPB	496 (20.0 ± 0.6)	496 (22.8 ± 0.5)	496 (28.1 ± 0.7)	504 (18.6 ± 0.6)	504 (14.7 ± 0.5)
NBS Concentration PPB	(21 ± 1)	(23 ± 1)	(29 ± 2)	(17 ± 1)	(15 ± 1)
6th RTI Analysis Day PPB	833 (144 ± 4.3)	833 (119 ± 2.5)	833 (135 ± 3.3)	810 (18.9 ± 0.6)	810 (15.2 ± 0.5)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A13

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(89.0)	(353)	(313)	(134)	(150)
1st Analysis Date PPB	12/07/83 (83.3)	12/07/83 (369)	12/07/83 (297)	12/08/83 (133)	12/08/83 (136)
2nd Analysis Date PPB	12/15/83 (81.0)	12/15/83 (371)	12/15/83 (315)	12/19/83 (139)	12/19/83 (145)
RTI ANALYSIS					
1st RTI Analysis Date PPB	1/09/84 (91.6 ± 2.7)	1/09/84 (351 ± 7.4)	1/09/84 (332 ± 8.0)	1/20/84 (140 ± 4.5)	1/20/84 (156 ± 5.0)
2nd RTI Analysis Day* PPB	57 (97.0 ± 2.9)	57 (354 ± 7.4)	57 (359 ± 8.6)	54 (139 ± 4.4)	54 (152 ± 4.9)
3rd RTI Analysis Day* PPB	231 (94.7 ± 2.8)	231 (334 ± 7.0)	231 (323 ± 7.8)	225 (145 ± 4.6)	225 (153 ± 4.9)
4th RTI Analysis Day* PPB	395 (86.7 ± 2.6)	395 (325 ± 6.8)	395 (322 ± 7.7)	370 (138 ± 4.4)	370 (153 ± 4.9)
5th RTI Analysis Day* PPB	491 (86.2 ± 2.6)	491 (331 ± 7.0)	491 (313 ± 7.5)	497 (138 ± 4.4)	497 (146 ± 4.7)
6th RTI Analysis Day* PPB	empty	empty	empty	empty	empty
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	1/09/84 (18.9 ± 0.6)	1/09/84 (9.4 ± 0.2)	1/09/84 (24.4 ± 0.6)	1/20/84 (18.4 ± 0.6)	1/20/84 (14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A13

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	57 (21.5 ± 0.6)	57 (10.1 ± 0.2)	57 (26.1 ± 0.6)	54 (192 ± 6.1)	54 (192 ± 6.1)
NBS Concentration** PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(192 ± 4)**	(192 ± 4)**
3rd RTI Analysis Day PPB	231 (155 ± 4.7)	231 (132 ± 2.8)	231 (147 ± 3.5)	225 (191 ± 6.1)	225 (191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day PPB	395 (154 ± 4.6)	395 (135 ± 2.8)	395 (145 ± 3.5)	370 (200 ± 6.4)	370 (195 ± 6.2)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day PPB	491 (142 ± 4.3)	491 (115 ± 2.4)	491 (126 ± 3.0)	497 (139 ± 4.4)	497 (149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day PPB	833 (166 ± 5.0)	833 (130 ± 2.7)	833 (144 ± 3.5)	810 (18.9 ± 0.6)	810 (15.2 ± 0.5)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A14

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(91.5)	(362)	(321)	(138)	(150)
1st Analysis Date	12/07/83	12/07/83	12/07/83	12/08/83	12/08/83
PPB	(81.6)	(373)	(301)	(130)	(137)
2nd Analysis Date	12/15/83	12/15/83	12/15/83	12/19/83	12/19/83
PPB	(78.3)	(367)	(312)	(135)	(145)
RTI ANALYSIS					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/20/84	1/20/84
PPB	(90.5 ± 2.7)	(339 ± 7.1)	(324 ± 7.8)	(138 ± 4.4)	(154 ± 4.9)
2nd RTI Analysis Day*	57	57	57	54	54
PPB	(90.6 ± 2.7)	(345 ± 7.2)	(342 ± 8.2)	(135 ± 4.3)	(151 ± 4.8)
3rd RTI Analysis Day*	231	231	231	225	225
PPB	(92.3 ± 2.8)	(326 ± 6.8)	(317 ± 7.6)	(140 ± 4.5)	(153 ± 4.9)
4th RTI Analysis Day*	395	395	395	371	371
PPB	(85.7 ± 2.6)	(335 ± 7.0)	(322 ± 7.7)	(137 ± 4.4)	(152 ± 4.9)
5th RTI Analysis Day*					
PPB	(86.2 ± 2.6)	(331 ± 7.0)	(307 ± 7.4)	(137 ± 4.4)	(150 ± 4.8)
6th RTI Analysis Day*	833	833	833	810	810
PPB	(73.9 ± 2.2)	(350 ± 7.4)	(320 ± 7.9)	(127 ± 4.1)	(160 ± 5.2)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/20/84	1/20/84
PPB	(18.9 ± 0.6)	(9.4 ± 0.2)	(24.4 ± 0.6)	(18.4 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(17 ± 1)	(15 ± 1)

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A14

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day	57	57	57	54	54
PPB	(21.5 ± 0.6)	(10.1 ± 0.2)	(26.1 ± 0.6)	(192 ± 6.1)	(192 ± 6.1)
NBS Concentration PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(192 ± 4)**	(192 ± 4)**
3rd RTI Analysis Day	231	231	231	225	225
PPB	(155 ± 4.7)	(132 ± 2.8)	(147 ± 3.5)	(191 ± 6.1)	(191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day	395	395	395	371	371
PPB	(155 ± 4.6)	(135 ± 2.8)	(146 ± 3.5)	(199 ± 6.4)	(187 ± 6.0)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day	491	491	491	497	497
PPB	(142 ± 4.3)	(115 ± 2.4)	(126 ± 3.0)	(139 ± 4.4)	(149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day	833	833	833	810	810
PPB	(166 ± 5.0)	(130 ± 2.7)	(144 ± 3.5)	(18.9 ± 0.6)	(15.2 ± 0.5)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(17.0 ± 1)	(15.0 ± 1)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A15

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(307)	(126)	(102)	(364)	(400)
1st Analysis Date	12/07/83	12/07/83	12/07/83	12/02/83	12/02/83
PPB	(301)	(130)	(98.3)	(350)	(397)
2nd Analysis Date	12/15/83	12/15/83	12/15/83	12/19/83	12/19/83
PPB	(293)	(143)	(119)	(360)	(393)
RTI ANALYSIS					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/20/84	1/20/84
PPB	(317 ± 6.7)	(125 ± 2.6)	(108 ± 2.6)	(382 ± 12.2)	(418 ± 13.4)
2nd RTI Analysis Day*	57	57	57	51	51
PPB	(327 ± 9.8)	(133 ± 2.8)	(119 ± 2.9)	(387 ± 12.4)	(404 ± 12.9)
3rd RTI Analysis Day*	231	231	231	227	227
PPB	(299 ± 9.0)	(126 ± 2.6)	(100 ± 2.4)	(391 ± 12.5)	(404 ± 12.9)
4th RTI Analysis Day*	395	395	395	370	370
PPB	(299 ± 9.0)	(126 ± 2.6)	(103 ± 2.5)	(378 ± 12.1)	(409 ± 13.1)
5th RTI Analysis Day*	491	491	491		
PPB	(297 ± 8.9)	(123 ± 2.6)	(104 ± 2.5)	on audit	on audit
6th RTI Analysis Day*	833	833	833	810	810
PPB	(310 ± 9.2)	(117 ± 2.5)	(121.6 ± 3.0)	(392 ± 12.6)	(426 ± 13.9)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/20/84	1/20/84
PPB	(162 ± 4.9)	(130 ± 2.7)	(148 ± 3.6)	(18.4 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(154 ± 3)	(134 ± 3)	(145 ± 3)	(17 ± 1)**	(15 ± 1)**

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A15

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	57 (21.5 ± 0.6)	57 (10.1 ± 0.2)	57 (26.1 ± 0.6)	51 (192 ± 6.1)	51 (192 ± 6.1)
NBS Concentration** PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(192 ± 4)**	(192 ± 4)**
3rd RTI Analysis Day PPB	231 (155 ± 4.7)	231 (132 ± 2.8)	231 (147 ± 3.5)	227 (191 ± 6.1)	227 (191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day PPB	395 (154 ± 4.6)	395 (135 ± 2.8)	395 (145 ± 3.5)	370 (200 ± 6.4)	370 (195 ± 6.2)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day PPB	491 (142 ± 4.3)	491 (115 ± 2.4)	491 (126 ± 3.0)	497 (139 ± 4.4)	497 (149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day PPB	833 (166 ± 5.0)	833 (130 ± 2.7)	833 (144 ± 3.5)	810 (143 ± 4.6)	810 (156 ± 5.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A16

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	(304)	(125)	(101)	(360)	(400)
1st Analysis Date	12/05/83	12/05/83	12/05/83	12/12/83	12/12/83
PPB	(297)	(120)	(91.5)	(344)	(397)
2nd Analysis Date	12/15/83	12/15/83	12/15/83	12/19/83	12/19/83
PPB	(293)	(135)	(87.9)	(355)	(382)
RTI ANALYSIS					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/20/84	1/20/84
PPB	(314 ± 9.4)	(122 ± 2.6)	(107 ± 2.6)	(377 ± 12.1)	(418 ± 13.4)
2nd RTI Analysis Day*	57	57	57	51	51
PPB	(323 ± 9.7)	(128 ± 2.7)	(119 ± 2.9)	(379 ± 12.1)	(403 ± 12.9)
3rd RTI Analysis Day*					
PPB	on audit	on audit	on audit	on audit	on audit
4th RTI Analysis Day*	395	395	395	370	370
PPB	(296 ± 8.9)	(126 ± 2.6)	(103 ± 2.5)	(368 ± 11.8)	(408 ± 13.1)
5th RTI Analysis Day*	491	491	491		
PPB	(295 ± 8.9)	(121 ± 2.5)	(104 ± 2.5)	on audit	on audit
6th RTI Analysis Day*	833	833	833	810	810
PPB	(307 ± 9.1)	(114 ± 2.4)	(120.3 ± 2.9)	(389 ± 12.5)	(423 ± 13.8)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	1/09/84	1/09/84	1/09/84	1/20/84	1/20/84
PPB	(162 ± 4.9)	(130 ± 2.7)	(148 ± 3.6)	(18.4 ± 0.6)	(14.8 ± 0.5)
NBS Concentration PPB	(154 ± 3)	(134 ± 3)	(145 ± 3)	(17 ± 1)**	(15 ± 1)**

(Continued)

STABILITY STUDY FOR GROUP I COMPOUNDS (Continued)
CYLINDER I-A16

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
RTI QUALITY CONTROL**					
2nd RTI Analysis Day PPB	57 (21.5 ± 0.6)	57 (10.1 ± 0.2)	57 (26.1 ± 0.6)	51 (192 ± 6.1)	51 (192 ± 6.1)
NBS Concentration** PPB	(19 ± 1)	(9 ± 1)	(22 ± 1)	(192 ± 4)**	(192 ± 4)**
3rd RTI Analysis Day PPB	231 (155 ± 4.7)	231 (132 ± 2.8)	231 (147 ± 3.5)	227 (191 ± 6.1)	227 (191 ± 6.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
4th RTI Analysis Day PPB	395 (154 ± 4.6)	395 (135 ± 2.8)	395 (145 ± 3.5)	370 (200 ± 6.4)	370 (195 ± 6.2)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(192 ± 4)	(192 ± 4)
5th RTI Analysis Day PPB	491 (142 ± 4.3)	491 (115 ± 2.4)	491 (126 ± 3.0)	497 (139 ± 4.4)	497 (149 ± 4.8)
NBS Concentration PPB	(141 ± 3)	(120 ± 3)	(126 ± 3)	(133 ± 3)	(154 ± 3)
6th RTI Analysis Day PPB	833 (166 ± 5.0)	833 (130 ± 2.7)	833 (144 ± 3.5)	810 (143 ± 4.6)	810 (156 ± 5.1)
NBS Concentration PPB	(155 ± 3)	(134 ± 3)	(146 ± 3)	(133 ± 3)	(154 ± 3)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated. Several different NBS primary standards were used.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A17

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	1500	800	1500	800	1500
1st Analysis Date	9/26/85	9/26/85	9/26/85	9/26/85	9/26/85
PPB	(1502)	(837)	(1441)	(805)	(1489)
RTI ANALYSIS					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(1585 ± 48)	(904 ± 19)	(1642 ± 40)	(904 ± 29)	(1648 ± 53)
2nd RTI Analysis Day*	68	68	68	68	68
PPB	(1584 ± 48)	(844 ± 18)	(1645 ± 40)	(881 ± 28)	(1585 ± 51)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(2279 ± 68)	(2328 ± 49)	(2044 ± 49)	(2868 ± 92)	(2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day	68	68	68	68	68
PPB	(2226 ± 67)	(2284 ± 48)	(2194 ± 53)	(2909 ± 93)	(2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A18

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	8000	4000	8000	8000	6000
1st Analysis Date PPB	9/26/85 (8400)	9/26/85 (3877)	9/26/85 (7938)	9/26/85 (7960)	9/26/85 (6061)
RTI ANALYSIS					
1st RTI Analysis Date PPB	5/07/86 (9386 ± 284)	5/07/86 (4418 ± 94)	5/07/86 (9486 ± 231)	5/07/86 (9458 ± 301)	5/07/86 (6555 ± 211)
2nd RTI Analysis Day* PPB	68 (9400 ± 285)	68 (4318 ± 92)	68 (9617 ± 234)	68 (9359 ± 297)	68 (6641 ± 214)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	5/07/86 (2279 ± 68)	5/07/86 (2328 ± 49)	5/07/86 (2044 ± 49)	5/07/86 (2868 ± 92)	5/07/86 (2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day PPB	68 (2226 ± 67)	68 (2284 ± 48)	68 (2194 ± 53)	68 (2909 ± 93)	68 (2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A19

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	6000	8000	4000	4000	8000
1st Analysis Date	9/26/85	9/26/85	9/26/85	9/26/85	9/26/85
PPB	(6084)	(7854)	(4155)	(4069)	(7824)
RTI ANALYSIS					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(8062 ± 244)	(9593 ± 205)	(4121 ± 100)	(4065 ± 129)	(9463 ± 304)
2nd RTI Analysis Day*	68	68	68	68	68
PPB	(7240 ± 219)	(9730 ± 208)	(4579 ± 111)	(4667 ± 148)	(8999 ± 290)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(2279 ± 68)	(2328 ± 49)	(2044 ± 49)	(2868 ± 92)	(2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day	68	68	68	68	68
PPB	(2226 ± 67)	(2284 ± 48)	(2194 ± 53)	(2909 ± 93)	(2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A20

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	6000	8000	4000	4000	8000
1st Analysis Date PPB	9/26/85 (6012)	9/26/85 (7829)	9/26/85 (4103)	9/26/85 (4055)	9/26/85 (7841)
RTI ANALYSIS					
1st RTI Analysis Date PPB	5/07/86 (6731 ± 204)	5/07/86 (9356 ± 200)	5/07/86 (4764 ± 116)	5/07/86 (4295 ± 137)	5/07/86 (9064 ± 292)
2nd RTI Analysis Day* PPB	68 (7340 ± 222)	68 (9521 ± 203)	68 (4739 ± 115)	68 (4784 ± 152)	68 (9142 ± 294)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	5/07/86 (2279 ± 68)	5/07/86 (2328 ± 49)	5/07/86 (2044 ± 49)	5/07/86 (2868 ± 92)	5/07/86 (2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day PPB	68 (2226 ± 67)	68 (2284 ± 48)	68 (2194 ± 53)	68 (2909 ± 93)	68 (2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A21

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	3000	6000	3000	6000	4000
1st Analysis Date	9/26/85	9/26/85	9/26/85	9/26/85	9/26/85
PPB	(2990)	(5979)	(3131)	(6139)	(4010)
RTI ANALYSIS					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(3220 ± 98)	(6277 ± 134)	(3157 ± 77)	(7127 ± 227)	(3994 ± 129)
2nd RTI Analysis Day*	68	68	68	68	68
PPB	(3246 ± 98)	(6808 ± 145)	(3416 ± 83)	(7008 ± 223)	(4238 ± 137)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(2279 ± 68)	(2328 ± 49)	(2044 ± 49)	(2868 ± 92)	(2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day	68	68	68	68	68
PPB	(2226 ± 67)	(2284 ± 48)	(2194 ± 53)	(2909 ± 93)	(2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A22

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	800	1500	800	1500	800
1st Analysis Date PPB	9/26/85 (796)	9/26/85 (1461)	9/26/85 (795)	9/26/85 (1497)	9/26/85 (783)
RTI ANALYSIS					
1st RTI Analysis Date PPB	5/07/86 (854 ± 26)	5/07/86 (1365 ± 29)	5/07/86 (784 ± 19)	5/07/86 (1533 ± 49)	5/07/86 (813 ± 26)
2nd RTI Analysis Day* PPB	68 (839 ± 25)	68 (1539 ± 33)	68 (846 ± 21)	68 (1587 ± 51)	68 (823 ± 27)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	5/07/86 (2279 ± 68)	5/07/86 (2328 ± 49)	5/07/86 (2044 ± 49)	5/07/86 (2868 ± 92)	5/07/86 (2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day PPB	68 (2226 ± 67)	68 (2284 ± 48)	68 (2194 ± 53)	68 (2909 ± 93)	68 (2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A23

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	800	1500	800	1500	800
1st Analysis Date PPB	9/26/85 (789)	9/26/85 (1431)	9/26/85 (789)	9/26/85 (1459)	9/26/85 (780)
RTI ANALYSIS					
1st RTI Analysis Date PPB	5/07/86 (822 ± 25)	5/07/86 (1313 ± 28)	5/07/86 (789 ± 19)	5/07/86 (1560 ± 50)	5/07/86 (857 ± 28)
2nd RTI Analysis Day* PPB	68 (839 ± 25)	68 (1492 ± 32)	68 (832 ± 20)	68 (1560 ± 50)	68 (834 ± 27)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	5/07/86 (2279 ± 68)	5/07/86 (2328 ± 49)	5/07/86 (2044 ± 49)	5/07/86 (2868 ± 92)	5/07/86 (2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day PPB	68 (2226 ± 67)	68 (2284 ± 48)	68 (2194 ± 53)	68 (2909 ± 93)	68 (2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A24

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	1500	800	1500	800	1500
1st Analysis Date PPB	9/26/85 (1480)	9/26/85 (811)	9/26/85 (1495)	9/26/85 (798)	9/26/85 (1491)
RTI ANALYSIS					
1st RTI Analysis Date PPB	5/07/86 (1582 ± 48)	5/07/86 (803 ± 17)	5/07/86 (1534 ± 37)	5/07/86 (760 ± 24)	5/07/86 (1492 ± 48)
2nd RTI Analysis Day* PPB	68 (1571 ± 47)	68 (830 ± 18)	68 (1530 ± 37)	68 (852 ± 27)	68 (1535 ± 50)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	5/07/86 (2279 ± 68)	5/07/86 (2328 ± 49)	5/07/86 (2044 ± 49)	5/07/86 (2868 ± 92)	5/07/86 (2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day PPB	68 (2226 ± 67)	68 (2284 ± 48)	68 (2194 ± 53)	68 (2909 ± 93)	68 (2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A25

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	4000	3000	6000	3000	3000
1st Analysis Date	9/26/85	9/26/85	9/26/85	9/26/85	9/26/85
PPB	(4166)	(2986)	(6095)	(3014)	(2932)
RTI ANALYSIS					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(4582 ± 138)	(3032 ± 66)	(6770 ± 165)	(3047 ± 97)	(3574 ± 116)
2nd RTI Analysis Day*	68	68	68	68	68
PPB	(4308 ± 130)	(3200 ± 68)	(6765 ± 164)	(3283 ± 104)	(3122 ± 101)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(2279 ± 68)	(2328 ± 49)	(2044 ± 49)	(2868 ± 92)	(2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day	68	68	68	68	68
PPB	(2226 ± 67)	(2284 ± 48)	(2194 ± 53)	(2909 ± 93)	(2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A26

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	8000	4000	8000	8000	6000
1st Analysis Date PPB	9/26/85 (8506)	9/26/85 (3892)	9/26/85 (7810)	9/26/85 (7951)	9/26/85 (6037)
RTI ANALYSIS					
1st RTI Analysis Date PPB	5/07/86 (9734 ± 294)	5/07/86 (4243 ± 90)	5/07/86 (9753 ± 236)	5/07/86 (9540 ± 302)	5/07/86 (7229 ± 234)
2nd RTI Analysis Day* PPB	68 (9632 ± 291)	68 (4405 ± 94)	68 (9788 ± 237)	68 (9491 ± 301)	68 (7009 ± 227)
RTI QUALITY CONTROL**					
1st RTI Analysis Date PPB	5/07/86 (2279 ± 68)	5/07/86 (2328 ± 49)	5/07/86 (2044 ± 49)	5/07/86 (2868 ± 92)	5/07/86 (2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day PPB	68 (2226 ± 67)	68 (2284 ± 48)	68 (2194 ± 53)	68 (2909 ± 93)	68 (2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A27

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	3000	6000	3000	6000	4000
1st Analysis Date	9/26/85	9/26/85	9/26/85	9/26/85	9/26/85
PPB	(2953)	(5942)	(3143)	(6119)	(3947)
RTI ANALYSIS					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(3421 ± 103)	(6435 ± 137)	(3239 ± 79)	(6820 ± 216)	(4049 ± 131)
2nd RTI Analysis Day*	68	68	68	68	68
PPB	(3231 ± 98)	(7191 ± 153)	(3345 ± 81)	(7177 ± 227)	(4158 ± 135)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(2279 ± 68)	(2328 ± 49)	(2044 ± 49)	(2868 ± 92)	(2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day	68	68	68	68	68
PPB	(2226 ± 67)	(2284 ± 48)	(2194 ± 53)	(2909 ± 93)	(2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP I COMPOUNDS
CYLINDER I-A28

ACTIVITY	COMPOUND				
	Carbon tetrachloride	Chloroform	Perchloroethylene	Benzene	Vinyl Chloride
MANUFACTURER ANALYSIS					
Theoretical PPB	4000	3000	6000	3000	3000
1st Analysis Date	9/26/85	9/26/85	9/26/85	9/26/85	9/26/85
PPB	(4041)	(2915)	(6105)	(3013)	(2937)
RTI ANALYSIS					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(4305 ± 130)	(3076 ± 65)	(6937 ± 168)	(3100 ± 98)	(3412 ± 110)
2nd RTI Analysis Day*	68	68	68	68	68
PPB	(4474 ± 135)	(3336 ± 71)	(6959 ± 169)	(3448 ± 109)	(3342 ± 108)
RTI QUALITY CONTROL**					
1st RTI Analysis Date	5/07/86	5/07/86	5/07/86	5/07/86	5/07/86
PPB	(2279 ± 68)	(2328 ± 49)	(2044 ± 49)	(2868 ± 92)	(2363 ± 76)
NBS Concentration PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)
2nd RTI Analysis Day	68	68	68	68	68
PPB	(2226 ± 67)	(2284 ± 48)	(2194 ± 53)	(2909 ± 93)	(2484 ± 80)
NBS Concentration** PPB	(2095 ± 16)	(2269 ± 10)	(2096 ± 13)	(2830 ± 9)	(2486 ± 27)

*Number of days after 1st RTI analysis date.

**NBS primary standard was analyzed as internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A1

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(161)	(164)	(164)	(161)	(149)	(150)	(151)	(162)	NC
1st Analysis Date PPB	3/05/84 (144)	3/05/84 (167)	3/05/84 (152)	3/05/84 (167)	3/05/84 (152)	3/07/84 (161)	3/07/84 (153)	3/05/84 (201)	NC
2nd Analysis Date PPB	4/03/84 (133)	4/03/84 (168)	4/03/84 (148)	4/03/84 (141)	4/03/84 (143)	4/04/84 (170)	4/04/84 (148)	4/03/84 (192)	NC
RTI ANALYSIS									
1st Analysis Date PPB	5/28/84 (145 ± 10.2)†	5/28/84 (194 ± 10.7)†	5/14/84 (147 ± 7.1)	5/14/84 (156 ± 8.0)	5/14/84** (130 ± 4.4)†	5/14/84 (172 ± 6.7)	5/08/84** (143 ± 5.9)†	5/08/84** (157 ± 6.4)†	NC
2nd Analysis Day*** PPB	82 (130 ± 9.1)†	82 (187 ± 10.3)†	98 (145 ± 7.0)	99 (150 ± 7.7)	98 (153 ± 5.2)	98 (170 ± 6.6)	104 (168 ± 6.9)	104 (183 ± 7.5)	NC
3rd Analysis Day*** PPB	302 (110 ± 7.7)	302 (144 ± 7.9)	287 (140 ± 6.7)	302 (146 ± 7.4)	287 (160 ± 5.4)	287 (168 ± 6.6)	293 (173 ± 7.1)	293 (177 ± 7.3)	NC
4th Analysis Day*** PPB	449 (112 ± 7.8)	449 (140 ± 7.7)	452 (141 ± 6.8)	452 (135 ± 6.9)	452 (161 ± 5.5)	452 (168 ± 6.6)	458 (164 ± 6.7)	458 (174 ± 7.1)	NC
5th Analysis Day*** PPB	750 on audit	750 on audit	775 on audit	771 on audit	775 on audit	775 on audit	775 on audit	771 on audit	765 on audit
RTI QUALITY CONTROL****									
3rd Analysis Day PPB	302 (78.5 ± 5.5)	302 (132 ± 7.3)	287 (118 ± 5.7)	302 (131 ± 6.7)	287 (153 ± 5.2)	287 (190 ± 7.4)	293 (112 ± 4.6)	293 (149 ± 6.1)	302 (149 ± 7.5)
NBS Concen. PPB	(82.7 ± 9.6)	(137 ± 6)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)
4th Analysis Day PPB	449 (85.2 ± 6.0)	449 (130 ± 7.2)	452 (120 ± 5.8)	452 (120 ± 6.1)	452 (154 ± 5.2)	452 (190 ± 7.4)	458 (119 ± 4.9)	458 (132 ± 5.4)	452 (139 ± 7.0)
NBS Concen. PPB	(82.7 ± 9.6)	(137 ± 6)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)
5th Analysis Day PPB	750 (13.0 ± 0.9)	750 (16.0 ± 0.9)	775 (11.5 ± 0.5)	771 (9.5 ± 0.4)	775 (10.7 ± 0.4)	775 (20.4 ± 0.8)	775 (10.6 ± 0.4)	771 (9.7 ± 0.4)	765 (11.8 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated. No Quality Control with NBS primary standards was performed during RTI 1st and 2nd analysis.

† = Questionable value.
NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A2

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(167)	(169)	(169)	(167)	(149)	(150)	(151)	(168)	NC
1st Analysis Date	3/16/84	3/16/84	3/16/84	3/16/84	3/16/84	3/20/84	3/20/84	3/16/84	
PPB	(110)	(140)	(135)	(108)	(147)	(163)	(152)	(175)	NC
2nd Analysis Date	4/03/84	4/03/84	4/03/84	4/03/84	4/03/84	4/05/84	4/05/84	4/03/84	
PPB	(107)	(146)	(144)	(139)	(141)	(165)	(147)	(184)	NC
RTI ANALYSIS									
1st Analysis Date	5/28/84	5/28/84	5/14/84	5/14/84	5/14/84**	5/14/84	5/08/84**	5/08/84**	
PPB	(124 ± 8.7)	(161 ± 8.9)	(146 ± 7.0)	(158 ± 8.1)	(129 ± 4.4)†	(169 ± 6.6)	(141 ± 5.8)†	(163 ± 6.7)†	NC
2nd Analysis Day***	82	82	98	98	98	98	104	104	
PPB	(146 ± 10.2)†	(178 ± 9.8)†	(143 ± 6.9)	(150 ± 7.7)	(152 ± 5.2)	(167 ± 6.5)	(166 ± 6.8)	(189 ± 7.7)	NC
3rd Analysis Day***	302	302	287	302	287	287	293	293	
PPB	(107 ± 7.5)	(130 ± 7.2)	(141 ± 6.8)	(136 ± 6.9)	(158 ± 5.4)	(165 ± 6.4)	(167 ± 6.8)	(186 ± 7.6)	NC
4th Analysis Day***	449	449	452	452	452	452	458	458	
PPB	(109 ± 7.6)	(128 ± 7.0)	(139 ± 6.7)	(139 ± 7.1)	(158 ± 5.4)	(164 ± 6.4)	(148 ± 6.1)	(164 ± 6.7)	NC
5th Analysis Day***	749	749	777	777	777	777	783	783	
	(119 ± 8.3)	(159 ± 8.4)	(141 ± 6.9)	(156 ± 8.1)	(163 ± 5.1)	(178 ± 7.1)	(163 ± 6.3)	(197 ± 8.1)	NC
RTI QUALITY CONTROL****									
3rd Analysis Day	302	302	287	302	287	287	293	293	302
PPB	(78.5 ± 5.5)	(132 ± 7.3)	(118 ± 5.7)	(131 ± 6.7)	(153 ± 5.2)	(190 ± 7.4)	(112 ± 4.6)	(149 ± 6.1)	(149 ± 7.5)
NBS Concen. PPB	(82.7 ± 9.6)	(137 ± 6)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)
4th Analysis Day	449	449	452	452	452	452	458	458	452
PPB	(85.2 ± 6.0)	(135 ± 7.4)	(120 ± 5.8)	(120 ± 6.1)	(154 ± 5.2)	(190 ± 7.4)	(119 ± 4.9)	(132 ± 5.4)	(139 ± 7.0)
NBS Concen. PPB	(82.7 ± 9.6)	(137 ± 6)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)
5th Analysis Day	749	749	777	777	777	777	783	783	783
PPB	(13.6 ± 0.9)	(16.1 ± 0.9)	(119 ± 6)	(126 ± 7)	(157 ± 5)	(180 ± 7)	(116 ± 4)	(158 ± 7)	(154 ± 8)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)

*Calibration was performed using permeation devices unless otherwise specified.

**Calibration was performed using stainless steel sphere dilution method.

***Number of days after 1st RTI analysis date.

****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated. No Quality Control with NBS primary standards was performed during RTI 1st and 2nd analysis.

† = Questionable value.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A3

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(166)	(168)	(168)	(166)	(149)	(150)	(151)	(167)	NC
1st Analysis Date PPB	3/16/84 (120)	3/16/84 (133)	3/16/84 (142)	3/16/84 (111)	3/16/84 (154)	3/07/84 (169)	3/07/84 (161)	3/16/84 (205)	NC
2nd Analysis Date PPB	4/03/84 (104)	4/03/84 (138)	4/03/84 (151)	4/03/84 (143)	4/03/84 (144)	4/05/84 (172)	4/05/84 (153)	4/03/84 (208)	NC
RTI ANALYSIS									
1st Analysis Date PPB	5/28/84 (107 ± 7.5)	5/28/84 (151 ± 8.3)†	5/14/84 (147 ± 7.1)	5/14/84 (163 ± 8.3)	5/14/84** (131 ± 4.5)†	5/14/84 (173 ± 6.7)	5/08/84** (144 ± 5.9)†	5/08/84** (165 ± 6.8)†	NC
2nd Analysis Day*** PPB	82 (146 ± 10.2)†	82 (170 ± 9.4)†	98 (145 ± 7.0)	98 (157 ± 8.0)	98 (155 ± 5.3)	98 (170 ± 6.6)	104 (170 ± 7.0)	104 (196 ± 8.0)	NC
3rd Analysis Day*** PPB	302 (106 ± 7.4)	302 (123 ± 6.8)	287 (142 ± 6.8)	302 (139 ± 7.1)	287 (161 ± 5.5)	287 (168 ± 6.6)	293 (170 ± 7.0)	293 (192 ± 7.9)	NC
4th Analysis Day*** PPB	on audit	on audit	on audit	on audit	on audit	on audit	on audit	on audit	NC
5th Analysis Day*** PPB	749 (139.7 ± 9.9)	749 (159.2 ± 8.4)	777 (142.8 ± 7.0)	777 (161.4 ± 8.3)	777 (168.4 ± 5.3)	777 (178.1 ± 7.1)	783 (167.8 ± 6.5)	783 (205.8 ± 8.5)	NC
RTI QUALITY CONTROL****									
3rd Analysis Day PPB	302 (78.5 ± 5.5)	302 (132 ± 7.3)	287 (118 ± 5.7)	302 (131 ± 6.7)	287 (153 ± 5.2)	287 (190 ± 7.4)	293 (112 ± 4.6)	293 (149 ± 6.1)	0 (149 ± 7.5)
NBS Concen. PPB	(82.7 ± 9.6)	(137 ± 6)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)
4th Analysis Day PPB	449 (85.2 ± 6.0)	449 (135 ± 7.4)	452 (120 ± 5.8)	452 (120 ± 6.1)	452 (154 ± 5.2)	452 (190 ± 7.4)	458 (119 ± 4.9)	458 (132 ± 5.4)	452 (139 ± 7.0)
NBS Concen. PPB	(82.7 ± 9.6)	(137 ± 6)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)
5th Analysis Day PPB	749 (13.6 ± 0.9)	749 (16.1 ± 0.8)	777 (119 ± 6)	777 (126 ± 7)	777 (157 ± 5)	777 (180 ± 7)	783 (116 ± 4)	783 (158 ± 7)	783 (154 ± 8)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated. No Quality Control with NBS primary standards was performed during RTI 1st and 2nd analysis.

† = Questionable value.
NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A4

ACTIVITY		COMPOUND								
		Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS										
Theoretical	PPB	(15.4)	(15.8)	(15.7)	(15.5)	(14.9)	(15.0)	(15.1)	(15.7)	(15.3)
1st Analysis	Date	3/15/84	3/15/84	3/15/84	3/15/84	3/21/84	3/21/84	3/21/84	3/15/84	3/15/84
	PPB	(14.0)	(16.3)	(16.3)	(10.7)	(11.5)	(11.9)	(15.0)	(17.8)	(11.6)
2nd Analysis	Date	4/02/84	4/02/84	4/02/84	4/02/84	4/05/84	4/05/84	4/05/84	4/02/84	4/02/84
	PPB	(14.0)	(16.2)	(17.5)	(11.5)	(13.3)	(12.5)	(14.6)	(16.1)	(15.3)
RTI ANALYSIS										
1st Analysis	Date	5/24/84	5/24/84	5/14/84	5/14/84	5/14/84	5/14/84	5/14/84**	5/14/84**	5/20/84
	PPB	(16.2 ± 1.1)	(20.2 ± 1.1)	(14.6 ± 0.7)	(15.3 ± 0.8)	(13.1 ± 0.4)**	(15.2 ± 0.6)	(13.7 ± 0.6)†	(11.3 ± 0.5)†	(16.9 ± 0.8)†
2nd Analysis	Day***	87	87	98	93	98	98	98	98	93
	PPB	(17.6 ± 1.2)	(19.4 ± 1.1)	(14.7 ± 0.7)	(14.4 ± 0.7)	(15.1 ± 0.5)	(15.4 ± 0.6)	(16.3 ± 0.7)	(16.5 ± 0.7)	(14.5 ± 0.7)
3rd Analysis	Day***									
	PPB	on audit	on audit	on audit	on audit	on audit	on audit	on audit	on audit	on audit
4th Analysis	Day***	454	454	449	443	449	449	449	449	443
	PPB	(15.9 ± 1.1)	(19.0 ± 1.0)	(14.2 ± 0.7)	(15.5 ± 0.8)	(16.0 ± 0.5)	(15.0 ± 0.6)	(15.6 ± 0.6)	(14.5 ± 0.6)	(13.3 ± 0.7)
5th Analysis	Day***	749	749	772	772	772	772	772	772	766
	PPB	(14.9 ± 1.1)	(18.1 ± 1.0)	(13.2 ± 0.7)	(16.7 ± 0.9)	(15.9 ± 0.5)	(12.6 ± 0.5)	(15.5 ± 0.6)	(16.2 ± 0.7)	(16.3 ± 0.9)
RTI QUALITY CONTROL****										
3rd Analysis	Day	309	309	297	310	297	297	297	297	310
	PPB	(14.1 ± 1.0)	(16.9 ± 0.9)	(10.9 ± 0.5)	(8.8 ± 0.4)	(10.7 ± 0.4)	(19.4 ± 0.8)	(8.2 ± 0.3)	(9.5 ± 0.4)	(11.4 ± 0.6)
NBS Concen.	PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
4th Analysis	Day	454	454	449	443	449	449	449	449	443
	PPB	(14.0 ± 1.0)	(16.9 ± 0.9)	(11.6 ± 0.6)	(9.1 ± 0.5)	(11.0 ± 0.4)	(19.3 ± 0.8)	(8.4 ± 0.3)	(8.8 ± 0.4)	(11.3 ± 0.6)
NBS Concen.	PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
5th Analysis	Day	749	749	772	772	772	772	772	772	766
	PPB	(13.0 ± 0.9)	(16.1 ± 0.8)	(10.9 ± 0.5)	(9.5 ± 0.5)	(10.6 ± 0.3)	(19.9 ± 0.8)	(10.8 ± 0.4)	(9.7 ± 0.4)	(11.8 ± 0.6)
NBS Concen.	PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated. No Quality Cont[illegible] with NBS primary standards was performed during RTI 1st and 2nd analysis.

† = Questionable value.
NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A5

ACTIVITY		COMPOUND							
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(15.5)	(16.0)	(15.9)	(15.7)	(15.0)	(15.0)	(15.0)	(15.9)	(15.5)
1st Analysis Date PPB	3/14/84 (8.9)	3/14/84 (7.8)	3/14/84 (16.9)	3/14/84 (11.2)	3/21/84 (9.6)	3/21/84 (11.3)	3/21/84 (16.0)	3/14/84 (18.2)	3/14/84 (11.3)
2nd Analysis Date PPB	4/02/84 (8.8)	4/02/84 (7.4)	4/02/84 (18.2)	4/02/84 (11.8)	4/05/84 (15.6)	4/05/84 (12.7)	4/05/84 (15.1)	4/02/84 (16.0)	4/02/84 (15.2)
RTI ANALYSIS									
1st Analysis Date PPB	5/24/84 (13.4 ± 0.9)†	5/24/84 (10.6 ± 0.6)†	5/14/84 (15.1 ± 0.7)	5/20/84 (14.6 ± 0.7)	5/14/84** (13.5 ± 0.5)†	5/14/84 (15.5 ± 0.6)	5/14/84** (13.8 ± 0.6)†	5/20/84** (16.2 ± 0.7)	5/20/84 (16.8 ± 0.8)†
2nd Analysis Day*** PPB	87 (13.8 ± 1.0)†	87 (8.5 ± 0.5)	98 (15.1 ± 0.7)	93 (14.7 ± 0.7)	98 (15.5 ± 0.5)	98 (15.4 ± 0.6)	98 (16.7 ± 0.7)	93 (16.8 ± 0.7)	98 (14.8 ± 0.7)
3rd Analysis Day*** PPB	309 (10.3 ± 0.7)	309 (8.0 ± 0.4)	on audit	310 (14.2 ± 0.7)	on audit	on audit	on audit	on audit	310 (14.1 ± 0.7)
4th Analysis Day*** PPB	454 (10.8 ± 0.8)	454 (9.3 ± 0.6)	449 (15.3 ± 0.7)	443 (15.4 ± 0.8)	449 (16.3 ± 0.6)	449 (14.6 ± 0.6)	449 (16.3 ± 0.7)	449 (14.1 ± 0.6)	443 (13.9 ± 0.7)
5th Analysis Day*** PPB	749 (13.1 ± 0.9)	749 (12.7 ± 0.7)	773 (15.1 ± 0.7)	767 (14.2 ± 0.7)	773 (16.3 ± 0.5)	773 (17.4 ± 0.7)	773 (16.4 ± 0.6)	773 (15.0 ± 0.6)	767 (15.7 ± 0.8)
RTI QUALITY CONTROL****									
3rd Analysis Day PPB	309 (14.1 ± 1.0)	309 (16.9 ± 0.9)	297 (10.9 ± 0.5)	310 (8.8 ± 0.4)	297 (10.7 ± 0.4)	297 (19.4 ± 0.8)	297 (8.2 ± 0.3)	297 (9.5 ± 0.4)	310 (11.4 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
4th Analysis Day PPB	454 (14.0 ± 1.0)	454 (16.9 ± 0.9)	449 (11.6 ± 0.6)	443 (9.1 ± 0.5)	449 (11.0 ± 0.4)	449 (19.3 ± 0.8)	449 (8.4 ± 0.3)	449 (8.8 ± 0.4)	443 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
5th Analysis Day PPB	749 (13.0 ± 0.9)	749 (16.1 ± 0.8)	773 (11.5 ± 0.6)	767 (9.8 ± 0.5)	773 (10.7 ± 0.3)	773 (20.4 ± 0.8)	773 (10.6 ± 0.4)	773 (10.2 ± 0.4)	767 (11.7 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.57)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.

**Calibration was performed using stainless steel sphere dilution method.

***Number of days after 1st RTI analysis date.

****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated. No Quality Control with NBS primary standards was performed during RTI 1st and 2nd analysis.

† = Questionable value.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A6

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(15.9)	(16.3)	(16.2)	(16.0)	(15.0)	(15.0)	(15.0)	(16.2)	(15.8)
1st Analysis Date PPB	3/14/84 (8.6)	3/14/84 (7.0)	3/14/84 (15.8)	3/14/84 (11.4)	3/20/84 (10.8)	5/14/84 (13.3)	3/20/84 (15.5)	3/14/84 (17.5)	3/14/84 (11.1)
2nd Analysis Date PPB	3/30/84 (8.0)	3/30/84 (7.1)	3/30/84 (18.3)	3/30/84 (12.7)	4/06/84 (13.9)	8/19/84 (12.2)	4/06/84 (14.2)	3/30/84 (18.2)	3/30/84 (14.4)
RTI ANALYSIS									
1st Analysis Date PPB	5/24/84 (12.0 ± 0.8)	5/24/84 (7.5 ± 0.4)	5/14/84 (15.6 ± 0.7)	5/20/84 (14.2 ± 0.7)	5/14/84** (13.4 ± 0.5)	5/14/84 (15.2 ± 0.6)	5/14/84** (13.6 ± 0.6)	5/14/84** (16.6 ± 0.7)	5/20/84 (17.4 ± 0.9)†
2nd Analysis Day*** PPB	87 (11.6 ± 0.8)	87 (6.7 ± 0.4)	98 (15.4 ± 0.7)	93 (15.7 ± 0.8)	98 (15.4 ± 0.5)	98 (14.9 ± 0.6)	98 (16.6 ± 0.7)	98 (16.0 ± 0.7)	93 (15.3 ± 0.8)
3rd Analysis Day*** PPB	309 (12.6 ± 0.9)	309 (7.3 ± 0.4)	on audit	310 (14.2 ± 0.7)	on audit	on audit	on audit	on audit	310 (14.3 ± 0.7)
4th Analysis Day*** PPB	454 (12.2 ± 0.8)	454 (7.5 ± 0.4)	449 (15.1 ± 0.7)	443 (15.8 ± 0.8)	449 (16.2 ± 0.5)	449 (14.0 ± 0.5)	449 (16.0 ± 0.7)	449 (11.8 ± 0.5)	443 (14.0 ± 0.7)
5th Analysis Day*** PPB	749 (13.1 ± 0.9)	749 (10.9 ± 0.6)	772 (14.4 ± 0.7)	766 (12.5 ± 0.6)	772 (15.6 ± 0.5)	772 (10.4 ± 0.4)	772 (16.4 ± 0.6)	772 (12.1 ± 0.5)	766 (14.8 ± 0.8)
RTI QUALITY CONTROL****									
3rd Analysis Day PPB	309 (14.1 ± 1.0)	309 (16.9 ± 0.9)	297 (10.9 ± 0.5)	310 (8.8 ± 0.4)	297 (10.7 ± 0.4)	297 (19.4 ± 0.8)	297 (8.2 ± 0.3)	297 (9.5 ± 0.4)	310 (11.4 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
4th Analysis Day PPB	454 (14.0 ± 1.0)	454 (16.9 ± 0.9)	449 (11.6 ± 0.6)	443 (9.1 ± 0.5)	449 (11.0 ± 0.4)	449 (19.3 ± 0.8)	449 (8.4 ± 0.3)	449 (8.8 ± 0.4)	443 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
5th Analysis Day PPB	749 (13.0 ± 0.9)	749 (16.1 ± 0.8)	772 (10.9 ± 0.5)	766 (9.5 ± 0.5)	772 (10.6 ± 0.3)	772 (19.9 ± 0.8)	772 (10.8 ± 0.4)	772 (9.7 ± 0.4)	766 (11.8 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.57)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated. No Quality Control with NBS primary standards was performed during RTI 1st and 2nd analysis.

† = Questionable value.
NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A7

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(10.0)	(10.0)	(10.0)	(12.0)	(10.1)	(10.4)	(9.9)	(10.0)	(10.0)
1st Analysis Date	11/13/84	11/13/84	11/13/84	11/13/84	12/12/84	12/12/84	12/12/84	11/13/84	11/13/84
PPB	(11.7)	(9.3)	(9.1)	(8.6)	(9.9)	(9.5)	(8.7)	(10.4)	(10.0)
2nd Analysis Date	1/02/85	1/02/85	1/02/85	1/02/85	1/18/85	1/18/85	1/18/85	1/02/85	1/02/85
PPB	(8.7)	(9.1)	(9.3)	(8.3)	(8.3)	(8.1)	(9.5)	(10.7)	(10.4)
RTI ANALYSIS									
1st Analysis Date	3/29/85	3/29/85	3/07/85	3/15/85	3/07/85	3/07/85	3/07/85	3/07/85	3/15/85
PPB	(7.9 ± 0.6)	(9.6 ± 0.5)	(9.0 ± 0.4)	(9.8 ± 0.5)	(9.4 ± 0.3)	(10.8 ± 0.4)	(9.9 ± 0.4)	(10.2 ± 0.4)	(10.1 ± 0.5)
2nd Analysis Day***									
PPB	on audit	on audit	on audit	on audit	on audit	on audit	on audit	on audit	on audit
3rd Analysis Day***	439	439	474	466	474	474	474	474	466
PPB	(9.3 ± 0.7)	(12.7 ± 0.7)	(8.6 ± 0.4)	(10.5 ± 0.5)	(9.4 ± 0.3)	(10.1 ± 0.4)	(10.6 ± 0.4)	(9.3 ± 0.4)	(8.5 ± 0.4)
RTI QUALITY CONTROL****									
1st Analysis Date	3/29/85	3/29/85	3/07/85	3/15/85	3/07/85	3/07/85	3/07/85	3/07/85	3/15/85
PPB	(14.1 ± 1.0)	(16.9 ± 0.9)	(10.9 ± 0.5)	(9.3 ± 0.5)	(10.7 ± 0.4)	(19.4 ± 0.8)	(8.2 ± 0.3)	(9.5 ± 0.4)	(11.9 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day	147	147	152	144	152	152	152	152	144
PPB	(12.0 ± 0.8)	(14.1 ± 0.8)	(11.6 ± 0.6)	(9.1 ± 0.5)	(11.0 ± 0.4)	(19.3 ± 0.8)	(8.4 ± 0.3)	(8.8 ± 0.4)	(11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day	439	439	474	466	474	474	474	474	466
PPB	(13.0 ± 0.9)	(16.1 ± 0.8)	(10.9 ± 0.5)	(9.5 ± 0.5)	(10.6 ± 0.3)	(19.9 ± 0.8)	(10.8 ± 0.4)	(9.7 ± 0.4)	(11.8 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.57)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A8

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(10.0)	(10.0)	(10.0)	(10.0)	(10.1)	(10.0)	(9.9)	(10.0)	(10.0)
1st Analysis Date PPB	11/06/84 (8.4)	11/06/84 (9.4)	11/06/84 (9.3)	11/06/84 (8.7)	12/11/84 (9.8)	12/11/84 (8.7)	12/11/84 (9.2)	11/06/84 (10.5)	11/06/84 (10.3)
2nd Analysis Date PPB	12/28/84 (11.0)	12/28/84 (9.2)	12/28/84 (9.4)	12/28/84 (8.7)	1/15/85 (11.9)	1/15/85 (9.2)	12/28/84 (9.6)	12/28/84 (11.2)	1/02/85 (10.6)
RTI ANALYSIS									
1st Analysis Date PPB	3/29/85 (10.7 ± 0.7)	3/29/85 (9.6 ± 0.5)	3/07/85 (9.2 ± 0.4)	3/15/85 (10.3 ± 0.5)	3/07/85 (9.6 ± 0.3)	3/07/85 (10.6 ± 0.4)	3/07/85 (9.9 ± 0.4)	3/07/85 (10.2 ± 0.4)	3/15/85 (10.1 ± 0.5)
2nd Analysis Day*** PPB	147 (10.1 ± 0.7)	147 (9.0 ± 0.5)	152 (9.5 ± 0.5)	144 (8.5 ± 0.4)	152 (9.7 ± 0.3)	152 (11.4 ± 0.4)	152 (10.5 ± 0.4)	152 (8.5 ± 0.3)	144 (9.4 ± 0.5)
3rd Analysis Day*** PPB	442 (10.2 ± 0.7)	442 (9.7 ± 0.5)	474 (8.9 ± 0.4)	466 (12.6 ± 0.7)	474 (10.3 ± 0.3)	474 (11.0 ± 0.4)	474 (11.8 ± 0.5)	474 (10.1 ± 0.4)	466 (10.5 ± 0.6)
RTI QUALITY CONTROL****									
1st Analysis Date PPB	3/29/85 (14.1 ± 1.0)	3/29/85 (16.9 ± 0.9)	3/07/85 (10.9 ± 0.5)	3/15/85 (9.3 ± 0.5)	3/07/85 (10.7 ± 0.4)	3/07/85 (19.4 ± 0.8)	3/07/85 (8.2 ± 0.3)	3/07/85 (9.5 ± 0.4)	3/15/85 (11.9 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day PPB	147 (12.0 ± 0.8)	147 (14.1 ± 0.8)	152 (11.6 ± 0.6)	144 (9.1 ± 0.5)	152 (11.0 ± 0.4)	152 (19.3 ± 0.8)	152 (8.4 ± 0.3)	152 (8.8 ± 0.4)	144 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day PPB	442 (13.6 ± 0.9)	442 (16.0 ± 0.8)	474 (10.9 ± 0.5)	466 (9.5 ± 0.5)	474 (10.6 ± 0.3)	474 (19.9 ± 0.8)	474 (10.8 ± 0.4)	474 (9.7 ± 0.4)	466 (11.8 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.57)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A9

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(10.0)	(10.0)	(10.0)	(10.0)	(10.1)	(10.2)	(9.9)	(10.0)	(10.0)
1st Analysis Date	11/07/84	11/07/84	11/07/84	11/07/84	12/01/84	12/01/84	12/01/84	11/07/84	11/07/84
PPB	(8.4)	(9.2)	(9.1)	(8.1)	(11.8)	(8.9)	(9.4)	(10.4)	(10.2)
2nd Analysis Date	12/31/84	12/31/84	12/31/84	12/31/84	1/15/85	1/15/85	1/15/85	12/31/84	12/31/85
PPB	(8.8)	(9.0)	(9.1)	(8.5)	(11.9)	(8.4)	(12.1)	(10.6)	(10.4)
RTI ANALYSIS									
1st Analysis Date	3/29/85	3/29/85	3/07/85	3/15/85	3/07/85	3/07/85	3/07/85	3/07/85	3/15/85
PPB	(10.7 ± 0.7)	(9.6 ± 0.5)	(9.0 ± 0.4)	(10.0 ± 0.5)	(9.5 ± 0.3)	(10.7 ± 0.4)	(9.5 ± 0.4)	(10.3 ± 0.4)	(10.0 ± 0.5)
2nd Analysis Day***	147	147	152	144	152	152	152	152	144
PPB	(10.1 ± 0.7)	(8.9 ± 0.5)	(9.4 ± 0.5)	(7.7 ± 0.4)	(9.6 ± 0.3)	(11.2 ± 0.4)	(10.4 ± 0.4)	(7.8 ± 0.3)	(9.3 ± 0.5)
3rd Analysis Day***	443	443	474	466	474	474	474	474	466
PPB	(10.2 ± 0.7)	(11.3 ± 0.6)	(9.3 ± 0.5)	(9.2 ± 0.5)	(9.7 ± 0.3)	(9.3 ± 0.4)	(12.2 ± 0.5)	(10.7 ± 0.4)	(9.8 ± 0.5)
RTI QUALITY CONTROL****									
1st Analysis Date	3/29/85	3/29/85	3/07/85	3/15/85	3/07/85	3/07/85	3/07/85	3/07/85	3/15/85
PPB	(14.1 ± 1.0)	(16.9 ± 0.9)	(10.9 ± 0.5)	(9.3 ± 0.5)	(10.7 ± 0.4)	(19.4 ± 0.8)	(8.2 ± 0.3)	(9.5 ± 0.4)	(11.9 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day	147	147	152	144	152	152	152	152	144
PPB	(12.0 ± 0.8)	(14.1 ± 0.8)	(11.6 ± 0.6)	(9.1 ± 0.5)	(11.0 ± 0.4)	(19.3 ± 0.8)	(8.4 ± 0.3)	(8.8 ± 0.4)	(11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day	443	443	474	466	474	474	474	474	466
PPB	(13.6 ± 0.9)	(16.1 ± 0.8)	(10.9 ± 0.5)	(9.5 ± 0.5)	(10.6 ± 0.3)	(19.9 ± 0.8)	(10.8 ± 0.4)	(9.7 ± 0.4)	(11.8 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.59)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A10

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
				MANUFACTURER ANALYSIS					
Theoretical PPB	(30.1)	(30.0)	(30.0)	(30.0)	(30.9)	(30.0)	(29.2)	(30.0)	(30.0)
1st Analysis Date PPB	11/14/84 (27.7)	11/14/84 (27.8)	11/14/84 (27.7)	11/14/84 (24.9)	12/26/84 (25.4)	12/26/84 (29.3)	12/26/84 (26.2)	11/14/84 (32.4)	11/14/84 (30.1)
2nd Analysis Date PPB	1/04/85 (34.3)	1/04/85 (29.0)	1/04/85 (26.8)	1/04/85 (26.8)	1/22/85 (27.7)	1/22/85 (30.1)	1/22/85 (27.9)	1/04/85 (33.3)	1/04/85 (31.7)
				RTI ANALYSIS					
1st Analysis Date PPB	3/27/85 (26.8 ± 1.9)	3/27/85 (28.0 ± 1.5)	3/05/85 (28.8 ± 1.4)	3/13/85 (30.2 ± 1.5)	3/05/85 (29.7 ± 1.0)	3/05/85 (32.1 ± 1.3)	3/05/85 (31.4 ± 1.3)	3/05/85 (30.8 ± 1.3)	3/13/85 (30.6 ± 1.5)
2nd Analysis Day*** PPB	147 (24.2 ± 1.7)	147 (29.0 ± 1.6)	155 (28.2 ± 1.4)	147 (27.3 ± 1.4)	155 (29.5 ± 1.0)	155 (31.4 ± 1.2)	155 (29.4 ± 1.2)	155 (32.6 ± 1.3)	147 (27.7 ± 1.4)
3rd Analysis Day*** PPB	445 (27.1 ± 1.9)	445 (27.4 ± 1.4)	472 (29.6 ± 1.5)	464 (28.6 ± 1.5)	472 (32.1 ± 1.0)	472 (30.5 ± 1.2)	472 (26.1 ± 1.0)	472 (30.4 ± 1.3)	464 (30.1 ± 1.6)
				RTI QUALITY CONTROL****					
1st Analysis Date PPB	3/27/85 (13.2 ± 0.9)	3/27/85 (16.8 ± 0.9)	3/05/85 (11.4 ± 0.5)	3/13/85 (9.5 ± 0.5)	3/05/85 (11.1 ± 0.4)	3/05/85 (21.0 ± 0.8)	3/05/85 (9.1 ± 0.4)	3/05/85 (10.0 ± 0.4)	3/13/85 (12.5 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day PPB	147 (12.5 ± 0.9)	147 (16.9 ± 0.9)	155 (11.3 ± 0.5)	147 (8.6 ± 0.4)	155 (11.2 ± 0.4)	155 (18.9 ± 0.7)	155 (8.3 ± 0.3)	155 (9.1 ± 0.4)	147 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day PPB	445 (13.6 ± 0.9)	445 (16.1 ± 0.8)	472 (11.5 ± 0.6)	464 (9.8 ± 0.5)	472 (10.7 ± 0.3)	472 (20.4 ± 0.8)	472 (10.6 ± 0.4)	472 (10.2 ± 0.4)	464 (11.7 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.59)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A11

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(30.1)	(30.0)	(30.0)	(30.0)	(30.3)	(30.0)	(29.7)	(30.0)	(30.0)
1st Analysis Date	11/28/84	11/28/84	11/28/84	11/28/84	12/21/84	12/21/84	12/21/84	11/28/84	11/28/84
PPB	(30.9)	(24.9)	(27.8)	(24.4)	(31.6)	(29.0)	(24.9)	(32.2)	(30.0)
2nd Analysis Date	1/04/85	1/04/85	1/04/85	1/04/85	1/22/85	1/22/85	1/22/85	1/04/85	1/04/85
PPB	(27.1)	(29.3)	(27.1)	(25.3)	(28.0)	(29.7)	(29.3)	(32.4)	(30.8)
RTI ANALYSIS									
1st Analysis Date	3/27/85	3/27/85	3/05/85	3/13/85	3/05/85	3/05/85	3/05/85	3/05/85	3/13/85
PPB	(26.1 ± 1.8)	(26.7 ± 1.5)	(28.9 ± 1.4)	(30.2 ± 1.5)	(30.5 ± 1.0)	(32.4 ± 1.3)	(32.2 ± 1.3)	(31.1 ± 1.3)	(30.6 ± 1.5)
2nd Analysis Day***	147	147	155	147	155	155	155	155	147
PPB	(24.1 ± 1.7)	(28.0 ± 1.5)	(27.6 ± 1.3)	(26.3 ± 1.3)	(29.7 ± 1.0)	(31.3 ± 1.2)	(29.7 ± 1.2)	(33.7 ± 1.4)	(27.5 ± 1.4)
3rd Analysis Day***	444	444	476	470	476	476	476	476	470
PPB	(27.1 ± 1.9)	(25.8 ± 1.4)	(29.5 ± 1.5)	(27.8 ± 1.4)	(32.9 ± 1.0)	(30.7 ± 1.2)	(26.2 ± 1.0)	(30.4 ± 1.3)	(29.8 ± 1.6)
RTI QUALITY CONTROL****									
1st Analysis Date	3/27/85	3/27/85	3/05/85	3/13/85	3/05/85	3/05/85	3/05/85	3/05/85	3/13/85
PPB	(13.2 ± 0.9)	(16.8 ± 0.9)	(11.4 ± 0.5)	(9.5 ± 0.5)	(11.1 ± 0.4)	(21.0 ± 0.8)	(9.1 ± 0.4)	(10.0 ± 0.4)	(12.5 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day	147	147	155	147	155	155	155	155	147
PPB	(12.5 ± 0.9)	(16.9 ± 0.9)	(11.3 ± 0.5)	(8.6 ± 0.4)	(11.2 ± 0.4)	(18.9 ± 0.7)	(8.3 ± 0.3)	(9.1 ± 0.4)	(11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day	444	444	476	470	476	476	476	476	470
PPB	(13.6 ± 0.9)	(16.0 ± 0.8)	(11.5 ± 0.6)	(9.8 ± 0.5)	(10.7 ± 0.3)	(20.4 ± 0.8)	(10.6 ± 0.4)	(10.2 ± 0.4)	(11.7 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.59)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A12

ACTIVITY	COMPOUND Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(10.0)	(29.9)	(10.0)	(9.9)	(9.9)	(29.6)	(29.8)	(29.9)	(29.9)
1st Analysis Date PPB	12/03/84 (7.6)	12/03/84 (27.1)	12/03/84 (9.4)	12/03/84 (9.4)	12/12/84 (7.8)	12/12/84 (27.4)	12/12/84 (36.2)	12/03/84 (32.1)	12/03/84 (32.7)
2nd Analysis Date PPB	1/08/85 (8.7)	1/08/85 (28.1)	1/08/85 (9.7)	1/08/85 (8.9)	1/21/85 (9.7)	1/21/85 (27.4)	1/21/85 (33.2)	1/08/85 (34.1)	1/08/85 (32.5)
RTI ANALYSIS									
1st Analysis Date PPB	3/29/85 (10.4 ± 0.7)	3/29/85 (26.4 ± 1.5)	3/07/85 (9.6 ± 0.5)	3/14/85 (10.3 ± 0.5)	3/07/85 (9.7 ± 0.3)	3/07/85 (31.0 ± 1.2)	3/07/85 (31.0 ± 1.3)	3/07/85 (30.4 ± 1.2)	3/14/85 (30.2 ± 1.5)
2nd Analysis Day*** PPB	146 (10.4 ± 0.7)	146 (27.2 ± 1.5)	153 (9.6 ± 0.5)	146 (10.3 ± 0.5)	153 (9.2 ± 0.3)	153 (31.5 ± 1.2)	153 (30.5 ± 1.3)	153 (31.3 ± 1.3)	146 (29.3 ± 1.5)
3rd Analysis Day*** PPB	442 (10.2 ± 0.7)	442 (29.0 ± 1.5)	474 (10.1 ± 0.5)	469 (10.5 ± 0.5)	474 (9.8 ± 0.3)	474 (39.1 ± 1.6)	474 (27.7 ± 1.1)	474 (31.8 ± 1.3)	469 (33.9 ± 1.8)
RTI QUALITY CONTROL******									
1st Analysis Date PPB	3/29/85 (14.1 ± 1.0)	3/29/85 (16.1 ± 0.9)	3/07/85 (10.9 ± 0.5)	3/14/85 (8.8 ± 0.4)	3/07/85 (10.7 ± 0.4)	3/07/85 (19.4 ± 0.8)	3/07/85 (8.2 ± 0.3)	3/07/85 (9.5 ± 0.4)	3/14/85 (11.4 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day PPB	146 (13.3 ± 0.9)	146 (17.0 ± 0.9)	153 (11.3 ± 0.5)	146 (8.6 ± 0.4)	153 (11.2 ± 0.4)	153 (18.9 ± 0.7)	153 (8.3 ± 0.3)	153 (9.1 ± 0.4)	146 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day PPB	442 (13.6 ± 0.9)	442 (16.0 ± 0.8)	474 (11.5 ± 0.6)	469 (9.8 ± 0.5)	474 (10.7 ± 0.3)	474 (20.4 ± 0.8)	474 (10.6 ± 0.4)	474 (10.2 ± 0.4)	469 (11.7 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.59)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.

**Calibration was performed using stainless steel sphere dilution method.

***Number of days after 1st RTI analysis date.

****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A13

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(10.0)	(30.3)	(10.0)	(10.0)	(10.0)	(30.2)	(30.0)	(30.0)	(30.0)
1st Analysis Date PPB	12/04/84 (10.2)	12/04/84 (30.2)	12/04/84 (10.0)	12/04/84 (9.1)	12/21/84 (10.7)	12/21/84 (29.8)	12/21/84 (31.5)	12/04/84 (35.0)	12/04/84 (32.8)
2nd Analysis Date PPB	1/09/85 (9.6)	1/09/85 (30.0)	1/09/85 (9.2)	1/09/85 (9.1)	1/21/85 (10.1)	1/21/85 (28.9)	1/21/85 (31.9)	1/09/85 (35.1)	1/09/85 (32.2)
RTI ANALYSIS									
1st Analysis Date PPB	3/29/85 (10.6 ± 0.7)	3/29/85 (28.7 ± 1.6)	3/07/85 (9.9 ± 0.5)	3/14/85 (10.3 ± 0.5)	3/07/85 (10.1 ± 0.3)	3/07/85 (33.3 ± 1.3)	3/07/85 (32.2 ± 1.3)	3/07/85 (32.1 ± 1.3)	3/14/85 (30.4 ± 1.5)
2nd Analysis Day*** PPB	146 (10.4 ± 0.7)	146 (26.9 ± 1.5)	153 (9.8 ± 0.5)	146 (9.8 ± 0.5)	153 (10.6 ± 0.4)	153 (32.8 ± 1.3)	153 (31.4 ± 1.3)	153 (32.9 ± 1.3)	146 (29.3 ± 1.5)
3rd Analysis Day*** PPB	443 (11.3 ± 0.8)	443 (30.0 ± 1.6)	474 (10.2 ± 0.5)	469 (9.7 ± 0.5)	474 (10.1 ± 0.3)	474 (30.0 ± 1.2)	474 (26.3 ± 1.0)	474 (32.0 ± 1.3)	469 (31.7 ± 1.7)
RTI QUALITY CONTROL****									
1st Analysis Date PPB	3/29/85 (14.1 ± 1.0)	3/29/85 (16.1 ± 0.9)	3/07/85 (10.9 ± 0.5)	3/14/85 (8.8 ± 0.4)	3/07/85 (10.7 ± 0.4)	3/07/85 (19.4 ± 0.8)	3/07/85 (8.2 ± 0.3)	3/07/85 (9.5 ± 0.4)	3/14/85 (11.4 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day PPB	146 (13.3 ± 0.9)	146 (17.0 ± 0.9)	153 (11.3 ± 0.5)	146 (8.6 ± 0.4)	153 (11.2 ± 0.4)	153 (18.9 ± 0.7)	153 (8.3 ± 0.3)	153 (9.1 ± 0.4)	146 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day PPB	443 (13.6 ± 0.9)	443 (16.1 ± 0.8)	474 (11.5 ± 0.6)	469 (9.8 ± 0.5)	474 (10.7 ± 0.3)	474 (20.4 ± 0.8)	474 (10.6 ± 0.4)	474 (10.2 ± 0.4)	469 (11.7 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.59)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.

**Calibration was performed using stainless steel sphere dilution method.

***Number of days after 1st RTI analysis date.

****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A14

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(41.6)	(20.0)	(40.1)	(40.1)	(40.1)	(20.1)	(20.1)	(20.2)	(20.1)
1st Analysis Date PPB	12/05/84 (47.7)	12/05/84 (17.7)	12/05/84 (35.9)	12/05/84 (33.0)	12/26/84 (27.4)	12/26/84 (19.8)	12/26/84 (19.3)	12/05/84 (21.3)	12/05/84 (19.9)
2nd Analysis Date PPB	1/11/85 (43.9)	1/11/85 (16.7)	1/11/85 (35.0)	1/11/85 (33.4)	1/23/85 (33.7)	1/23/85 (19.2)	1/23/85 (20.8)	1/11/85 (22.2)	1/11/85 (19.9)
RTI ANALYSIS									
1st Analysis Date PPB	3/27/85 (37.3 ± 2.6)	3/27/85 (16.4 ± 0.9)	3/05/85 (37.9 ± 1.8)	3/13/85 (41.0 ± 2.1)	3/05/85 (36.8 ± 1.3)	3/05/85 (21.9 ± 0.9)	3/05/85 (21.8 ± 0.9)	3/05/85 (21.9 ± 0.9)	3/13/85 (19.8 ± 1.0)
2nd Analysis Day*** PPB	148 (38.1 ± 2.7)	148 (16.4 ± 0.9)	156 (38.0 ± 1.8)	148 (38.8 ± 2.0)	156 (38.6 ± 1.3)	156 (21.8 ± 0.8)	156 (20.6 ± 0.8)	156 (24.7 ± 1.0)	148 (18.2 ± 0.9)
3rd Analysis Day*** PPB	445 (38.4 ± 2.7)	445 (16.1 ± 0.8)	476 (39.4 ± 1.9)	470 (37.4 ± 1.9)	476 (40.8 ± 1.3)	476 (23.1 ± 0.9)	476 (20.3 ± 0.8)	476 (20.8 ± 0.9)	470 (19.1 ± 1.0)
RTI QUALITY CONTROL****									
1st Analysis Date PPB	3/27/85 (13.2 ± 0.9)	3/27/85 (16.8 ± 0.9)	3/05/85 (11.4 ± 0.5)	3/13/85 (9.5 ± 0.5)	3/05/85 (11.1 ± 0.4)	3/05/85 (21.0 ± 0.8)	3/05/85 (9.1 ± 0.4)	3/05/85 (10.0 ± 0.4)	3/13/85 (12.5 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day PPB	148 (13.3 ± 0.9)	148 (17.0 ± 0.9)	156 (11.2 ± 0.5)	148 (8.5 ± 0.4)	156 (11.2 ± 0.4)	156 (18.9 ± 0.7)	156 (8.5 ± 0.3)	156 (9.3 ± 0.4)	148 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day PPB	445 (13.6 ± 0.9)	445 (16.1 ± 0.8)	476 (11.5 ± 0.6)	470 (9.8 ± 0.5)	476 (10.7 ± 0.3)	476 (20.4 ± 0.8)	476 (10.6 ± 0.4)	476 (10.2 ± 0.4)	470 (11.7 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.59)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.
**Calibration was performed using stainless steel sphere dilution method.
***Number of days after 1st RTI analysis date.
****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A15

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(41.5)	(20.0)	(40.0)	(40.0)	(40.0)	(20.1)	(20.0)	(20.1)	(20.0)
1st Analysis Date PPB	12/07/84 (45.1)	12/07/84 (18.8)	12/07/84 (36.6)	12/07/84 (33.2)	12/27/84 (35.1)	12/27/84 (19.7)	12/27/84 (22.2)	12/07/84 (22.4)	12/07/84 (19.9)
2nd Analysis Date PPB	1/14/85 (43.9)	1/14/85 (18.4)	1/14/85 (38.4)	1/14/85 (34.4)	1/23/85 (33.8)	1/23/85 (19.2)	1/23/85 (16.1)	1/14/85 (23.1)	1/14/85 (20.3)
RTI ANALYSIS									
1st Analysis Date PPB	3/27/85 (36.3 ± 2.5)	3/27/85 (18.3 ± 1.0)	3/05/85 (38.4 ± 1.8)	3/13/85 (40.7 ± 2.1)	3/05/85 (36.6 ± 1.2)	3/05/85 (21.9 ± 0.9)	3/05/85 (21.9 ± 0.9)	3/05/85 (21.9 ± 0.9)	3/13/85 (20.1 ± 1.0)
2nd Analysis Day*** PPB	148 (37.6 ± 2.6)	148 (18.5 ± 1.0)	156 (38.4 ± 1.8)	148 (39.3 ± 2.0)	156 (38.5 ± 1.3)	156 (22.0 ± 0.9)	156 (20.8 ± 0.9)	156 (21.7 ± 0.9)	148 (18.2 ± 0.9)
3rd Analysis Day*** PPB	445 (37.3 ± 2.6)	445 (17.7 ± 0.9)	476 (41.9 ± 2.1)	470 (38.0 ± 2.0)	476 (42.0 ± 1.3)	476 (25.4 ± 1.0)	476 (21.0 ± 0.8)	476 (22.2 ± 0.9)	470 (21.2 ± 1.1)
RTI QUALITY CONTROL******									
1st Analysis Date PPB	3/27/85 (13.2 ± 0.9)	3/27/85 (16.8 ± 0.9)	3/05/85 (11.4 ± 0.5)	3/13/85 (9.5 ± 0.5)	3/05/85 (11.1 ± 0.4)	3/05/85 (21.0 ± 0.8)	3/05/85 (9.1 ± 0.4)	3/05/85 (10.0 ± 0.4)	3/13/85 (12.5 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
2nd Analysis Day PPB	148 (13.3 ± 0.9)	148 (17.0 ± 0.9)	156 (11.2 ± 0.5)	148 (8.5 ± 0.4)	156 (11.2 ± 0.4)	156 (18.9 ± 0.7)	156 (8.5 ± 0.3)	156 (9.3 ± 0.4)	148 (11.3 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.37)	(9.61 ± 0.29)	(11.9 ± 0.3)
3rd Analysis Day PPB	445 (13.6 ± 0.9)	445 (16.1 ± 0.8)	476 (11.5 ± 0.6)	470 (9.8 ± 0.5)	476 (10.7 ± 0.3)	476 (20.4 ± 0.8)	476 (10.6 ± 0.4)	476 (10.2 ± 0.4)	470 (11.7 ± 0.6)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(11.6 ± 0.3)	(9.14 ± 0.59)	(11.3 ± 0.6)	(23.0 ± 0.6)	(9.41 ± 0.59)	(9.61 ± 0.29)	(11.9 ± 0.3)

*Calibration was performed using permeation devices unless otherwise specified.

**Calibration was performed using stainless steel sphere dilution method.

***Number of days after 1st RTI analysis date.

****NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

NC = This compound was not included in this cylinder.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A16

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)
1st Analysis Date PPB	5/09/86 (87.0)	5/09/86 (134)	5/09/86 (137)	5/09/86 (128)	5/09/86 (153)	5/09/86 (139)	5/09/86 (147)	5/09/86 (153)	5/09/86 (144)
RTI ANALYSIS									
1st Analysis Date PPB	6/17/86 (153.7 ± 10.6)	6/17/86 (167.2 ± 8.8)	7/01/86 (147.5 ± 7.2)	7/01/86 (154.7 ± 8.0)	7/01/86 (154.5 ± 4.8)	7/01/86 (184.1 ± 7.4)	7/01/86 (160.7 ± 6.2)	7/01/86 (158.4 ± 6.6)	7/01/86 (152.1 ± 8.0)
RTI QUALITY CONTROL**									
1st Analysis Date PPB	6/17/86 (13.6 ± 0.9)	6/17/86 (16.1 ± 0.8)	7/01/86 (120 ± 6)	7/01/86 (126 ± 7)	7/01/86 (157 ± 5)	7/01/86 (181 ± 7)	7/01/86 (116 ± 5)	7/01/86 (159 ± 7)	7/01/86 (154 ± 8)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)

*Calibration was performed using permeation devices unless otherwise specified.

**NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A17

ACTIVITY		COMPOUND								
		Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS										
Theoretical	PPB	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)
1st Analysis	Date	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86
	PPB	(51.4)	(106)	(135)	(127)	(158)	(136)	(142)	(152)	(138)
RTI ANALYSIS										
1st Analysis	Date	6/17/86	6/17/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86
	PPB	(47.1 ± 3.3)	(111.5 ± 5.9)	(148.3 ± 7.3)	(154.2 ± 8.0)	(156.0 ± 4.9)	(162.6 ± 6.5)	(160.1 ± 6.2)	(162.8 ± 6.7)	(152.1 ± 8.0)
RTI QUALITY CONTROL**										
1st Analysis	Date	6/17/86	6/17/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86
	PPB	(13.6 ± 0.9)	(16.1 ± 0.8)	(120 ± 6)	(126 ± 7)	(157 ± 5)	(181 ± 7)	(116 ± 5)	(159 ± 7)	(154 ± 8)
NBS Concen.	PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)

*Calibration was performed using permeation devices unless otherwise specified.

**NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP II COMPOUNDS*
CYLINDER II-A18

ACTIVITY	COMPOUND								
	Acetonitrile	Methyl Ethyl Ketone	Trichloro-ethylene	1,2-Dichloro-ethane	Trichloro-fluoro-methane (F-11)	Bromomethane	Dichlorodi-fluorometh-ane (F-12)	1,2-Dibro-moethane	1,1,1-Trichloro-ethane
MANUFACTURER ANALYSIS									
Theoretical PPB	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)	(150)
1st Analysis Date	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86	5/09/86
PPB	(82.4)	(132)	(137)	(128)	(145)	(138)	(146)	(154)	(146)
RTI ANALYSIS									
1st Analysis Date	6/17/86	6/17/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86
PPB	(139.7 ± 9.7)	(159.2 ± 8.4)	(147.6 ± 7.3)	(154.3 ± 7.9)	(153.0 ± 4.8)	(185.6 ± 7.4)	(161.0 ± 6.2)	(162.6 ± 6.7)	(151.4 ± 8.0)
RTI QUALITY CONTROL**									
1st Analysis Date	6/17/86	6/17/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86	7/01/86
PPB	(13.6 ± 0.9)	(16.1 ± 0.8)	(120 ± 6)	(126 ± 7)	(157 ± 5)	(181 ± 7)	(116 ± 5)	(159 ± 7)	(154 ± 8)
NBS Concen. PPB	(12.1 ± 1.9)	(15.8 ± 2.0)	(118 ± 1)	(123 ± 2)	(151 ± 5)	(193 ± 3)	(116 ± 4)	(150 ± 2)	(147 ± 3)

*Calibration was performed using permeation devices unless otherwise specified.

**NBS primary standard was analyzed as internal Quality Control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-Al

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(30.0)	(30.0)	(30.1)	(10)	(10)	(10.1)	(10.1)
1st Analysis Date PPB	4-24-85 (27.2)	4-24-85 (27.9)	4-24-85 (26.9)	4-24-85 (10)	4-24-85 (9)	4-24-85 (8.6)	4-24-85 (9.5)
2nd Analysis Date PPB	6-1-85 (28.3)	6-1-85 (27.8)	6-1-85 (28.8)	6-1-85 (9)	6-1-85 (9)	6-1-85 (9.0)	6-1-85 (8.0)
RTI ANALYSIS							
1st Analysis Date PPB	3-27-86 (24.0 ± 3.4)	3-27-86 (30.2 ± 3.0)	3-27-86 (29.5 ± 3.0)	3-27-86 (10 ± 3)	3-27-86 (8 ± 4)	3-27-86 (9.8 ± 1.1)	3-27-86 (10.8 ± 1.3)
2nd Analysis Day** PPB	52 (21.9 ± 3.1)	52 (29.2 ± 2.9)	52 (31.2 ± 3.2)	52 (11 ± 3)	52 (9 ± 5)	52 (10.1 ± 1.1)	52 (10.6 ± 1.3)
3rd Analysis Day** PPB	150 (24.6 ± 4.6)	150 (30.2 ± 3.9)	150 (30.7 ± 4.2)	150 (8.6 ± 2.6)	150 (10.0 ± 3.2)	150 (12.3 ± 0.8)	150 (10.7 ± 1.8)
RTI QUALITY CONTROL***							
1st Analysis Date PPB	3-27-86 (11.6 ± 1.7)	3-27-86 (20.1 ± 1.8)	3-27-86 (8.3 ± 0.9)	3-27-86 (12 ± 3)	3-27-86 (13 ± 8)	3-27-86 (15.7 ± 1.6)	3-27-86 (7.9 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.1)	(8.1 ± 0.5)
2nd Analysis Day PPB	52 (15.0 ± 2.1)	52 (15.8 ± 1.6)	52 (21.5 ± 2.2)	52 (47 ± 14)	52 (42 ± 21)	52 (10.3 ± 1.2)	52 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	150 (8.7 ± 1.6)	150 (14.8 ± 1.9)	150 (16.3 ± 2.2)	150 (13.0 ± 4.0)	150 (20.5 ± 6.7)	150 (10.0 ± 0.7)	150 (11.9 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A2

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chlorobenzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(10.0)	(10.0)	(10.2)	(32)	(30)	(30.0)	(30.0)
1st Analysis Date PPB	4-22-85 (9.0)	4-22-85 (10.5)	4-22-85 (10.7)	4-22-85 (21)	4-22-85 (33)	4-22-85 (27.0)	4-22-85 (30.2)
2nd Analysis Date PPB	6-3-85 (8.4)	6-3-85 (8.9)	6-3-85 (10.7)	6-3-85 (19)	6-3-85 (29)	6-3-85 (27.4)	6-3-85 (30.6)
RTI ANALYSIS							
1st Analysis Date PPB	3-9-86 (8.4 ± 1.2)	3-9-86 (9.3 ± 1.0)	3-9-86 (9.5 ± 1.0)	3-9-86 (24 ± 6)	3-9-86 (29 ± 16)	3-9-86 (27.5 ± 3.2)	3-9-86 (30.4 ± 3.5)
2nd Analysis Day** PPB	70 (7.8 ± 1.1)	70 (9.3 ± 0.9)	70 (9.7 ± 1.0)	70 (27 ± 8)	70 (28 ± 14)	70 (28.3 ± 3.2)	70 (29.1 ± 3.5)
3rd Analysis Day** PPB	150 (7.6 ± 1.4)	150 (9.6 ± 1.2)	150 (10.6 ± 1.5)	150 (25.3 ± 7.9)	150 (32.2 ± 10.6)	150 (32.8 ± 2.3)	150 (28.3 ± 4.8)
RTI QUALITY CONTROL***							
1st Analysis Date PPB	3-9-86 (11.9 ± 1.7)	3-9-86 (20.4 ± 1.8)	3-9-86 (8.8 ± 0.9)	3-9-86 (11 ± 3)	3-9-86 (14 ± 8)	3-9-86 (13.5 ± 1.6)	3-9-86 (8.1 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.2)	(8.1 ± 0.5)
2nd Analysis Day PPB	70 (15.0 ± 2.1)	70 (15.8 ± 1.6)	70 (21.5 ± 2.2)	70 (47 ± 14)	70 (42 ± 21)	70 (10.3 ± 1.2)	70 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	150 (8.7 ± 1.6)	150 (14.8 ± 1.9)	150 (16.3 ± 2.2)	150 (13.0 ± 4.0)	150 (20.5 ± 6.7)	150 (10.0 ± 0.7)	150 (11.8 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A3

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(29.9)	(10.0)	(30.8)	(10)	(30)	(10.2)	(30.0)
1st Analysis Date PPB	7-24-85 (28.3)	7-24-85 (8.5)	7-24-85 (29.4)	7-24-85 (8)	7-24-85 (28)	7-24-85 (8.8)	7-24-85 (31.0)
2nd Analysis Date PPB	8-28-85 (27.7)	8-28-85 (9.1)	8-28-85 (29.5)	8-28-85 (7)	8-28-85 (25)	8-28-85 (8.6)	8-28-85 (30.7)
RTI ANALYSIS							
1st Analysis Date PPB	3-27-86 (24.5 ± 3.5)	3-27-86 (9.4 ± 1.0)	3-27-86 (30.6 ± 3.1)	3-27-86 (10 ± 3)	3-27-86 (27 ± 15)	3-27-86 (10.0 ± 1.1)	3-27-86 (31.4 ± 3.6)
2nd Analysis Day** PPB	52 (22.8 ± 3.2)	52 (10.5 ± 1.0)	52 (32.0 ± 3.2)	52 (9 ± 3)	52 (26 ± 13)	52 (9.9 ± 1.1)	52 (29.5 ± 3.6)
3rd Analysis Day** PPB	150 (27.6 ± 5.2)	150 (10.3 ± 1.3)	150 (32.4 ± 4.5)	150 (7.1 ± 2.2)	150 (33.5 ± 11.0)	150 (10.4 ± 0.7)	150 (29.6 ± 5.0)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	3-27-86 (11.6 ± 1.7)	3-27-86 (20.1 ± 1.8)	3-27-86 (8.3 ± 0.9)	3-27-86 (12 ± 3)	3-27-86 (16 ± 8)	3-27-86 (12.7 ± 1.6)	3-27-86 (7.9 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.1)	(8.1 ± 0.5)
2nd Analysis Day PPB	52 (15.0 ± 2.1)	52 (15.8 ± 1.6)	52 (21.5 ± 2.2)	52 (47 ± 14)	52 (42 ± 21)	52 (10.3 ± 1.2)	52 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	150 (8.7 ± 1.6)	150 (14.8 ± 1.9)	150 (16.3 ± 2.2)	150 (13.0 ± 4.0)	150 (20.5 ± 6.7)	150 (10.0 ± 0.7)	150 (11.8 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A4

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chlorobenzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(10.0)	(10.1)	(10.3)	(33)	(30)	(30.3)	(30.3)
1st Analysis Date PPB	4-15-85 (9.9)	4-15-85 (10.2)	4-15-85 (10.2)	4-15-85 (23)	4-15-85 (33)	4-15-85 (29.7)	4-15-85 (32.8)
2nd Analysis Date PPB	6-3-85 (9.4)	6-3-85 (9.7)	6-3-85 (11.8)	6-3-85 (22)	6-3-85 (29)	6-3-85 (29.5)	6-3-85 (33.1)
RTI ANALYSIS							
1st Analysis Date PPB	3-9-86 (9.2 ± 1.4)	3-9-86 (10.2 ± 1.4)	3-9-86 (10.4 ± 1.0)	3-9-86 (25 ± 6)	3-9-86 (30 ± 17)	3-9-86 (29.0 ± 3.4)	3-9-86 (32.1 ± 3.7)
2nd Analysis Day** PPB	70 (8.5 ± 1.2)	70 (10.1 ± 1.0)	70 (10.9 ± 1.1)	70 (28 ± 8)	70 (29 ± 15)	70 (30.8 ± 3.5)	70 (31.4 ± 3.8)
3rd Analysis Day** PPB	150 (7.6 ± 1.4)	150 (10.3 ± 1.3)	150 (11.7 ± 1.6)	150 (24.7 ± 7.7)	150 (33.7 ± 11.1)	150 (33.5 ± 2.3)	150 (30.8 ± 5.2)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	3-9-86 (11.9 ± 1.7)	3-9-86 (20.4 ± 1.8)	3-8-86 (8.8 ± 0.9)	3-9-86 (11 ± 3)	3-9-86 (14 ± 8)	3-9-86 (13.5 ± 1.6)	3-9-86 (8.1 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.2)	(8.1 ± 0.5)
2nd Analysis Day PPB	70 (15.0 ± 2.1)	70 (15.8 ± 1.6)	70 (21.5 ± 2.2)	70 (47 ± 14)	70 (42 ± 21)	70 (10.3 ± 1.2)	70 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	150 (8.7 ± 1.6)	150 (14.8 ± 1.9)	150 (16.3 ± 2.2)	150 (13.0 ± 4.0)	150 (20.5 ± 6.7)	150 (10.0 ± 0.7)	150 (11.8 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.
** Number of days after 1st RTI analysis date.
*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*

Cylinder III-A5

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chlorobenzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(10.1)	(10.2)	(10.1)	(10.0)	(10.1)	(10.1)	(10.1)
1st Analysis Date PPB	4-12-85 (9.3)	4-12-85 (10.0)	4-12-85 (8.7)	4-12-85 (9.4)	4-12-85 (9.0)	4-12-85 (9.0)	4-12-85 (9.7)
2nd Analysis Date PPB	5-29-85 (9.6)	5-29-85 (9.8)	5-29-85 (9.3)	5-29-85 (9.3)	5-29-85 (8.6)	5-29-85 (9.2)	5-29-85 (8.9)
RTI ANALYSIS							
1st Analysis Date PPB	on audit	on audit	on audit	on audit	on audit	on audit	on audit
2nd Analysis Day** PPB	on audit	on audit	on audit	on audit	on audit	on audit	on audit
3rd Analysis Day** PPB	151 (7.2 ± 1.4)	151 (10.2 ± 1.3)	151 (12.5 ± 1.7)	151 (6.7 ± 2.1)	151 (10.1 ± 3.3)	151 (10.5 ± 0.7)	151 (10.8 ± 1.8)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	3-9-86 (11.9 ± 1.7)	3-9-86 (20.4 ± 1.8)	3-9-86 (8.8 ± 0.9)	3-9-86 (11 ± 3)	3-9-86 (14 ± 8)	3-9-86 (13.5 ± 1.6)	3-9-86 (8.1 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.2)	(8.1 ± 0.5)
2nd Analysis Day PPB	70 (15.0 ± 2.1)	70 (15.8 ± 1.6)	70 (21.5 ± 2.2)	70 (47 ± 14)	70 (42 ± 21)	70 (10.3 ± 1.2)	70 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	151 (11.9 ± 2.2)	151 (15.1 ± 1.9)	151 (14.8 ± 2.0)	151 (12.3 ± 3.8)	151 (16.5 ± 5.4)	151 (9.6 ± 0.7)	151 (12.0 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A6

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chlorobenzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(30.0)	(10.0)	(30.9)	(10)	(30)	(10.2)	(30.0)
1st Analysis Date PPB	7-23-85 (28.6)	7-23-85 (9.6)	7-23-85 (29.6)	7-23-85 (8)	7-23-85 (26)	7-23-85 (8.6)	7-23-85 (30.4)
2nd Analysis Date PPB	8-27-85 (31.6)	8-27-85 (9.1)	8-27-85 (29.8)	8-27-85 (8)	8-27-85 (26)	8-27-85 (8.7)	8-27-85 (31.0)
RTI ANALYSIS							
1st Analysis Date PPB	3-27-86 (23.7 ± 3.4)	3-27-86 (9.7 ± 0.9)	3-27-86 (30.1 ± 3.0)	3-27-86 (10 ± 3)	3-27-86 (26 ± 15)	3-27-86 (9.8 ± 1.1)	3-27-86 (30.2 ± 3.4)
2nd Analysis Day** PPB	52 (21.4 ± 3.0)	52 (10.1 ± 1.0)	52 (32.4 ± 3.3)	52 (10 ± 3)	52 (29 ± 15)	52 (10.5 ± 1.2)	52 (30.3 ± 3.6)
3rd Analysis Day** PPB	150 (25.7 ± 4.9)	150 (9.6 ± 1.2)	150 (31.8 ± 4.4)	150 (9.9 ± 3.1)	150 (33.5 ± 11.0)	150 (10.2 ± 0.7)	150 (29.8 ± 5.0)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	3-27-86 (11.6 ± 1.7)	3-27-86 (20.1 ± 1.8)	3-27-86 (8.3 ± 0.9)	3-27-86 (12 ± 3)	3-27-86 (16 ± 8)	3-27-86 (12.7 ± 1.6)	3-27-86 (7.9 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.1)	(8.1 ± 0.5)
2nd Analysis Day PPB	52 (15.0 ± 2.1)	52 (15.8 ± 1.6)	52 (21.5 ± 2.2)	52 (47 ± 14)	52 (42 ± 21)	52 (10.3 ± 1.2)	52 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	150 (8.7 ± 1.6)	150 (14.8 ± 1.9)	150 (16.3 ± 2.2)	150 (13.0 ± 4.0)	150 (20.5 ± 6.7)	150 (10.0 ± 0.7)	150 (11.8 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A7

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(10.0)	(10.2)	(10.1)	(10)	(10)	(10.1)	(10.1)
1st Analysis Date PPB	4-10-85 (9.9)	4-10-85 (9.6)	4-10-85 (8.9)	4-10-85 (11)	4-10-85 (9)	4-10-85 (9.0)	4-10-85 (9.7)
2nd Analysis Date PPB	5-22-85 (9.8)	5-22-85 (9.8)	5-22-85 (9.3)	5-22-85 (8)	5-22-85 (7)	5-22-85 (9.0)	5-22-85 (8.8)
RTI ANALYSIS							
1st Analysis Date PPB	3-9-86 (9.1 ± 1.3)	3-9-86 (10.2 ± 1.0)	3-9-86 (8.7 ± 0.9)	3-9-86 (9 ± 3)	3-9-86 (10 ± 6)	3-9-86 (10.6 ± 1.3)	3-9-86 (11.1 ± 1.5)
2nd Analysis Day** PPB	72 (8.6 ± 1.2)	72 (10.0 ± 1.0)	72 (9.5 ± 1.0)	72 (9 ± 3)	72 (11 ± 6)	72 (10.6 ± 1.2)	72 (10.9 ± 1.3)
3rd Analysis Day** PPB	150 (8.3 ± 1.6)	150 (10.3 ± 1.3)	150 (8.9 ± 1.2)	150 (9.9 ± 3.1)	150 (13.0 ± 4.2)	150 (10.9 ± 0.8)	150 (11.7 ± 2.0)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	3-9-86 (11.9 ± 1.7)	3-9-86 (20.4 ± 1.8)	3-9-86 (8.8 ± 0.9)	3-9-86 (11 ± 3)	3-9-86 (14 ± 8)	3-9-86 (13.5 ± 1.6)	3-9-86 (8.1 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.1)	(8.1 ± 0.5)
2nd Analysis Day PPB	72 (14.6 ± 2.0)	72 (15.8 ± 1.6)	72 (21.5 ± 2.2)	72 (48 ± 14)	72 (42 ± 21)	72 (10.5 ± 1.2)	72 (11.0 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	150 (8.7 ± 1.6)	150 (14.8 ± 1.9)	150 (16.3 ± 2.2)	150 (13.0 ± 4.0)	150 (20.5 ± 6.7)	150 (10.0 ± 0.7)	150 (11.8 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A8

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(10.0)	(10.2)	(10.1)	(10)	(10)	(10.1)	(10.1)
1st Analysis Date PPB	4-10-85 (9.9)	4-10-85 (9.6)	4-10-85 (8.9)	4-10-85 (11)	4-10-85 (9)	4-10-85 (9.0)	4-10-85 (9.7)
2nd Analysis Date PPB	5-22-85 (9.8)	5-22-85 (9.8)	5-22-85 (9.3)	5-22-85 (8)	5-22-85 (7)	5-22-85 (9.0)	5-22-85 (8.8)
RTI ANALYSIS							
1st Analysis Date PPB	3-9-86 (9.1 ± 1.3)	3-9-86 (10.0 ± 1.0)	3-9-86 (8.7 ± 0.9)	3-9-86 (9 ± 3)	3-9-86 (10 ± 6)	3-9-86 (10.3 ± 1.2)	3-9-86 (10.9 ± 1.4)
2nd Analysis Day** PPB	70 (8.6 ± 1.2)	70 (10.1 ± 1.0)	70 (9.3 ± 0.9)	70 (11 ± 3)	70 (12 ± 6)	70 (10.6 ± 1.2)	70 (12.1 ± 1.5)
3rd Analysis Day** PPB	151 (9.3 ± 1.8)	151 (9.7 ± 1.3)	151 (8.5 ± 1.1)	151 (8.8 ± 2.7)	151 (10.5 ± 3.4)	151 (10.7 ± 0.7)	151 (10.8 ± 1.8)
RTI QUALITY CONTROL***							
1st Analysis Date PPB	3-9-86 (11.9 ± 1.7)	3-9-86 (20.4 ± 1.8)	3-9-86 (8.8 ± 0.9)	3-9-86 (11 ± 3)	3-9-86 (14 ± 8)	3-9-86 (13.5 ± 1.6)	3-9-86 (8.1 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.1)	(8.1 ± 0.5)
2nd Analysis Day PPB	70 (15.0 ± 2.1)	70 (15.8 ± 1.6)	70 (21.5 ± 2.2)	70 (47 ± 14)	70 (42 ± 21)	70 (10.3 ± 1.2)	70 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	151 (11.9 ± 2.2)	151 (15.1 ± 1.9)	151 (14.8 ± 2.0)	151 (12.3 ± 3.8)	151 (16.5 ± 5.4)	151 (9.6 ± 0.7)	151 (12.0 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

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* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A9

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(30.0)	(30.0)	(30.1)	(10)	(10)	(10.1)	(10.1)
1st Analysis Date PPB	4-23-85 (27.6)	4-23-85 (28.9)	4-23-85 (28.0)	4-23-85 (10)	4-23-85 (9)	4-23-85 (8.8)	4-23-85 (9.6)
2nd Analysis Date PPB	6-4-85 (27.3)	6-4-85 (28.7)	6-4-85 (27.2)	6-4-85 (5)	6-4-85 (9)	6-4-85 (8.8)	6-4-85 (8.3)
RTI ANALYSIS							
1st Analysis Date PPB	3-27-86 (24.8 ± 3.5)	3-27-86 (31.1 ± 3.1)	3-27-86 (31.3 ± 3.1)	3-27-86 (10 ± 3)	3-27-86 (10 ± 5)	3-27-86 (10.1 ± 1.2)	3-27-86 (10.2 ± 1.4)
2nd Analysis Day** PPB	on audit	on audit	on audit	on audit	on audit	on audit	on audit
3rd Analysis Day** PPB	151 (29.7 ± 5.6)	151 (31.8 ± 4.1)	151 (33.0 ± 4.6)	151 (6.7 ± 2.1)	151 (14.9 ± 4.9)	151 (11.6 ± 0.8)	151 (11.1 ± 1.9)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	3-27-86 (11.7 ± 1.7)	3-27-86 (20.5 ± 1.8)	3-27-86 (8.5 ± 0.9)	3-27-86 (12 ± 3)	3-27-86 (14 ± 8)	3-27-86 (14.2 ± 1.6)	3-27-86 (8.0 ± 1.1)
NBS Concen. PPB	(10.6 ± 1.0)	(20.2 ± 1.2)	(9.2 ± 0.5)	(14 ± 3)	(15 ± 6)	(13.2 ± 1.1)	(8.1 ± 0.5)
2nd Analysis Day PPB	52 (15.0 ± 2.1)	52 (15.8 ± 1.6)	52 (21.5 ± 2.2)	52 (47 ± 14)	52 (42 ± 21)	52 (10.3 ± 1.2)	52 (11.4 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
3rd Analysis Day PPB	151 (11.9 ± 2.2)	151 (15.1 ± 1.9)	151 (14.8 ± 2.0)	151 (12.3 ± 3.8)	151 (16.5 ± 5.4)	151 (9.6 ± 0.7)	151 (12.0 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A10

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(140)	(140)	(120)	(100)	(100)	(150)	(150)
1st Analysis Date PPB	5-9-86 (140)	5-9-86 (138)	5-9-86 (117)	5-9-86 (94.2)	5-9-86 (107)	5-9-86 (152)	5-9-86 (181)
RTI ANALYSIS							
1st Analysis Date PPB	5-21-86 (137 ± 19)	5-21-86 (152 ± 15)	5-21-86 (122 ± 12)	5-21-86 (112 ± 33)	5-21-86 (114 ± 57)	5-21-86 (159 ± 18)	5-21-86 (153 ± 19)
2nd Analysis Day** PPB	97 (125 ± 23)	97 (143 ± 18)	97 (123 ± 17)	97 (114 ± 35)	97 (125 ± 41)	97 (161 ± 11)	97 (152 ± 26)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	5-21-86 (14.6 ± 2.0)	5-21-86 (15.8 ± 1.6)	5-21-86 (21.5 ± 2.2)	5-21-86 (48 ± 14)	5-21-86 (42 ± 21)	5-21-86 (10.5 ± 1.2)	5-21-86 (11.0 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
2nd Analysis Day PPB	97 (11.9 ± 2.2)	97 (15.1 ± 1.9)	97 (14.8 ± 2.0)	97 (12.3 ± 3.8)	97 (16.5 ± 5.4)	97 (9.6 ± 0.7)	97 (12.0 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-All

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(140)	(140)	(140)	(120)	(120)	(150)	(150)
1st Analysis Date PPB	5-9-86 (139)	5-9-86 (140)	5-9-86 (142)	5-9-86 (111)	5-9-86 (116)	5-9-86 (155)	5-9-86 (182)
RTI ANALYSIS							
1st Analysis Date PPB	5-21-86 (139 ± 20)	5-21-86 (155 ± 15)	5-21-86 (148 ± 15)	5-21-86 (109 ± 32)	5-21-86 (134 ± 67)	5-21-86 (169 ± 19)	5-21-86 (167 ± 20)
2nd Analysis Day** PPB	97 (131 ± 24)	97 (148 ± 19)	97 (152 ± 20)	97 (93 ± 29)	97 (152 ± 49)	97 (169 ± 12)	97 (156 ± 26)
RTI QUALITY CONTROL***							
1st Analysis Date PPB	5-21-86 (14.6 ± 2.0)	5-21-86 (15.8 ± 1.6)	5-21-86 (21.5 ± 2.2)	5-21-86 (48 ± 14)	5-21-86 (42 ± 21)	5-21-86 (10.5 ± 1.2)	5-21-86 (11.0 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
2nd Analysis Day PPB	97 (11.9 ± 2.2)	97 (15.1 ± 1.9)	97 (14.8 ± 2.0)	97 (12.3 ± 3.8)	97 (16.5 ± 5.4)	97 (9.6 ± 0.7)	97 (12.0 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

STABILITY STUDY FOR GROUP III COMPOUNDS*
Cylinder III-A12

ACTIVITY	COMPOUND						
	Freon 114	Freon 113	Vinylidiene Chloride	Acetone	1,4-Dioxane	Toluene	Chloro-benzene
MANUFACTURER ANALYSIS							
Theoretical PPB	(140)	(140)	(140)	(120)	(120)	(150)	(150)
1st Analysis Date PPB	5-9-86 (143)	5-9-86 (139)	5-9-86 (138)	5-9-86 (118)	5-9-86 (113)	5-9-86 (148)	5-9-86 (175)
RTI ANALYSIS							
1st Analysis Date PPB	5-21-86 (138 ± 20)	5-21-86 (151 ± 15)	5-21-86 (148 ± 15)	5-21-86 (143 ± 43)	5-21-86 (134 ± 67)	5-21-86 (163 ± 18)	5-21-86 (157 ± 19)
2nd Analysis Day** PPB	97 (128 ± 24)	97 (145 ± 19)	97 (152 ± 21)	97 (152 ± 47)	97 (154 ± 50)	97 (165 ± 11)	97 (157 ± 27)
RTI QUALITY CONTROL* **							
1st Analysis Date PPB	5-21-86 (14.6 ± 2.0)	5-21-86 (15.8 ± 1.6)	5-21-86 (21.5 ± 2.2)	5-21-86 (48 ± 14)	5-21-86 (42 ± 21)	5-21-86 (10.5 ± 1.2)	5-21-86 (11.0 ± 1.4)
NBS Concen. PPB	(18.1 ± 1.8)	(15.7 ± 0.9)	(20.8 ± 1.1)	(47 ± 8)	(42 ± 17)	(10.8 ± 0.9)	(11.2 ± 0.7)
2nd Analysis Day PPB	97 (11.9 ± 2.2)	97 (15.1 ± 1.9)	97 (14.8 ± 2.0)	97 (12.3 ± 3.8)	97 (16.5 ± 5.4)	97 (9.6 ± 0.7)	97 (12.0 ± 2.0)
NBS Concen. PPB	(10.8 ± 1.4)	(15.4 ± 1.0)	(16.0 ± 1.0)	(13.8 ± 2.2)	(15.9 ± 3.0)	(9.9 ± 0.6)	(12.3 ± 0.7)

* Calibration was performed using NBS primary standard unless otherwise specified.

** Number of days after 1st RTI analysis date.

*** A different NBS primary standard was analyzed as an internal quality control on each day of RTI analysis unless otherwise indicated.

APPENDIX B
AUDIT INSTRUCTIONS

RESEARCH TRIANGLE INSTITUTE

Center for Environmental Measurements

Date________________

Name_____________________________
Organization______________________
Address__________________________

Dear____________________:

Research Triangle Institute (RTI) has been requested to provide you with _________ cylinder(s) of parts-per-billion level multicomponent mixture containing____ in nitrogen for a Volatile Organic Sampling Train (VOST) audit by ________. We are shipping these cylinders today by ___________ as per the request. Please draw the sample into your sampling train through a glass manifold following the instruction #3 (enclosure) and provide your analysis results to the Project Officer, ______________________. A glass manifold and necessary equipment were also provided to draw the sample from the audit cylinder for your convenience.

Please note that these cylinders have been analyzed several times and are very valuable. We urge you to use only the amount of gas required to conduct the audit of your analytical system and return the cylinders and all the equipment (glass manifold etc.) sent to you as soon as possible so that other organizations may also participate in the audit program. I am requesting that you submit the audit results to the Project Officer or to me and ship the cylinders and all other equipment back to Research Triangle Institute, Building #6, Post Office Box 12194, Research Triangle Park, North Carolina 27709, within 15 days of the date of delivery at your cost. We would appreciate your cooperation in this regard.

If you have any questions or comments concerning these audit cylinders, please feel free to call me at (919) 541-6483.

Sincerely,

R.K.M. Jayanty

R.K.M. Jayanty
Project Leader

cc: Darryl von Lehmden,
EMSL/EPA

RJ:dw

INSTRUCTIONS FOR THE SAMPLING AND ANALYSIS OF VOLATILE POHC FROM QUALITY ASSURANCE AUDIT CYLINDERS USING THE BAG TECHNIQUE

1.0 PURPOSE

This audit is intended to assess and document the accuracy and precision of the principle organic hazardous constituents (POHC) using the bag technique during trial burns at hazardous waste burning facilities. This audit also can be used to determine the proficiency of source testing organization prior to the actual trial burn tests.

2.0 PRINCIPLE

A gas sample containing POHC is drawn from an audit gas cylinder into a bag. The collected POHC are analyzed by gas chromatography according to the method specifications and procedures.

3.0 AUDIT MATERIAL (GAS CYLINDERS)

The audit material is contained in gas cylinders. A maximum of 5 L of audit gas is to be used for each test run. A two-stage gas regulator, 1/4-inch male/female glass joints, and Teflon® tubing are supplied for use with the gas cylinder.

4.0 PROCEDURES

The following step-by-step procedures should be used for sample collection and analysis using the bag technique.

Step A. Evacuate the bag with a vacuum pump and fill the bag with approximately 5 L of organic-free nitrogen from a gas cylinder. Tedlar® bags are recommended. Determine the hazardous constituents of interest by gas chromatography. Report the concentrations determined as Blank Value 1. The blank value must be not more than twice the detection limit. If it is higher, the bag cleaning procedure should be repeated.

Step B. After the blank analysis, evacuate the bag with a vacuum pump and fill the bag with approximately 5 L of audit gas from the audit cylinder. The 1/4 inch male/female glass joints that are supplied should be used as connections to the bag and the audit cylinder. Minimum Teflon® tubing should be used. Determine the POHC of interest by gas chromatography. Report the concentrations of each constituent as Analysis Result 1.

Step C. Evacuate the bag contents and fill the bag with organic free nitrogen (Cleaning Step 1). After 3 minutes, evacuate the bag contents and fill the bag again with nitrogen (Cleaning Step 2). After three minutes, repeat the evacuation procedure and fill the bag with 5 L of nitrogen (Blank 2). Determine the concentration of the bag contents by gas chromatography and report the measured concentration as Blank Value 2. The blank value must not be more than twice the detection limit. If it is higher, the bag cleaning procedure should be repeated.

Step D. Evacuate the bag contents and fill the bag with approximately 5 L of audit gas from the audit cylinder. Determine the POHC of interest by gas chromatography. Report the concentrations determined as Analysis Result 2.

Step E. Repeat Step C and report the measured concentration of the bag contents as Blank Value 3. The blank value must not be more than twice the detection limit. If it is higher, the bag cleaning procedures should be repeated.

Step F. Evacuate the bag contents and fill the bag with approximately 5 L of audit gas from the audit cylinder. Determine the POHC of interest by gas chromatography. Report the concentrations determined as Analysis Result 3.

5.0 SAMPLE ANALYSIS

Follow the procedures described in the method used for sample analysis, calibration, and calculations. Submit the results to the Project Officer and to the audit supervisor for evaluation.

INSTRUCTIONS FOR THE SAMPLING AND ANALYSIS OF VOLATILE POHC FROM QUALITY ASSURANCE AUDIT CYLINDERS USING THE VOLATILE ORGANIC SAMPLING TRAIN

1.0 PURPOSE

This audit is intended to assess and document the accuracy and precision of the volatile organic sampling train (VOST) when used during trial burns at hazardous waste burning facilities. This audit also can be used to determine the proficiency of source testing organization prior to the actual trial burn tests.

2.0 PRINCIPLE

A gas sample containing principal organic hazardous constituents (POHC) is passed from an audit gas cylinder into a glass manifold and is used in place of the test site stack sample. While the POHC gas is being passed into the glass manifold, a major portion of the gas is drawn through a VOST according to the method specifications and procedures. The collected POHC are analyzed by thermal desorption, purge and trap, and gas chromatography/mass spectrometry (GC/MS) or an equivalent method approved by the EPA.

3.0 APPARATUS

3.1 GLASS MANIFOLD

A glass manifold is supplied. One side of the glass manifold is connected with Teflon® tubing to the audit cylinder. The other end of the glass manifold should be connected with Teflon® tubing to a rotameter and the excess gas from the rotameter should be vented into a hood. The glass manifold is heated to 100°C with heating tape. The heating tape, rotameter, 1/4-inch male/female glass joints, and Teflon® tubing are also supplied. One port of the glass manifold should be connected to the VOST probe with 1/4-inch male/female glass joints. A schematic diagram of the glass manifold is shown in Figure 1.

3.2 VOST COMPONENTS

The sampling train component parts, except for the glass manifold, are the same as those used for VOST.

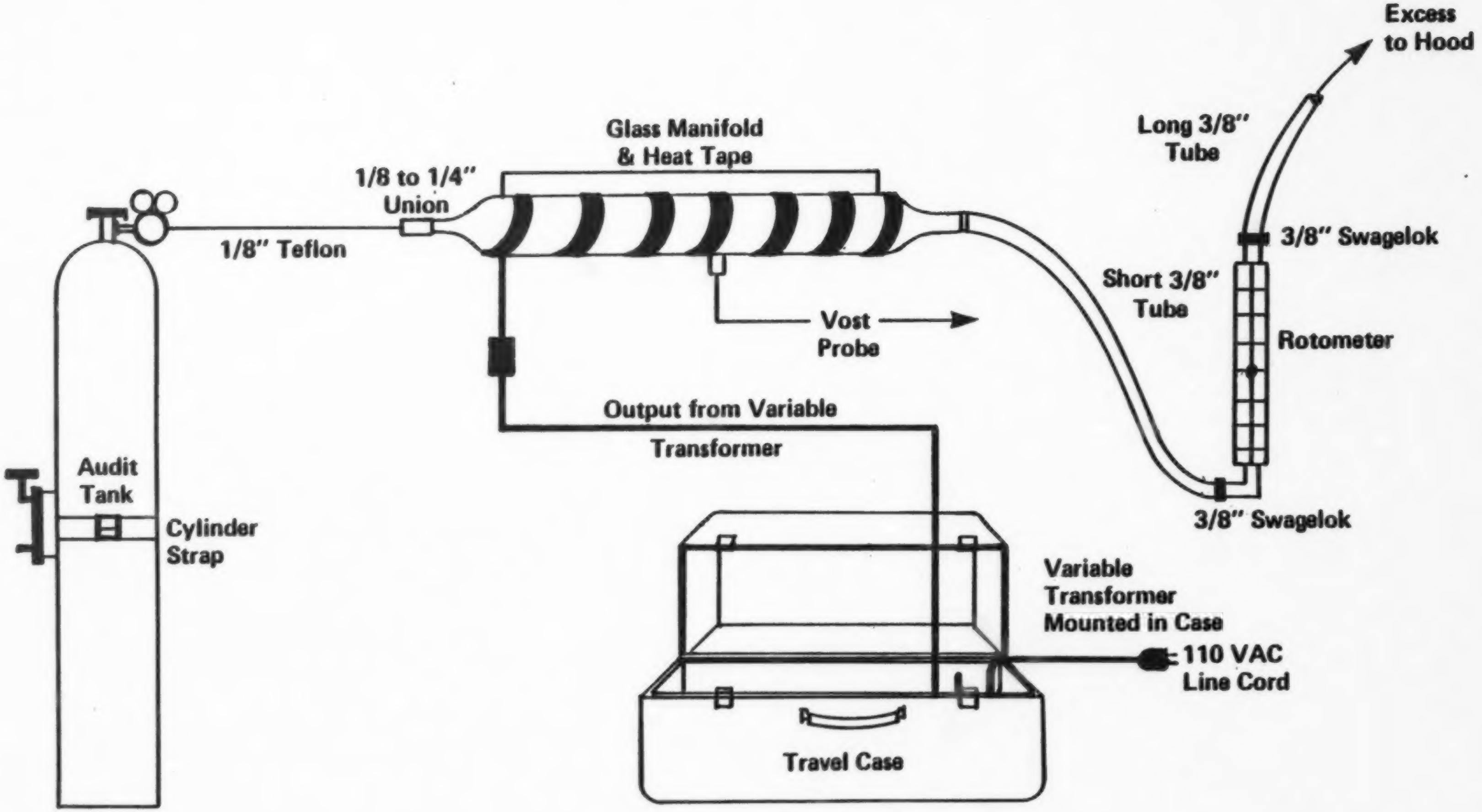
Excess
to Hood
Glass Manifold
& Heat Tape
Long 3/8"
Tube
1/8 to 1/4"
Union
3/8" Swagelok
1/8" Teflon
Short 3/8"
Tube
Vost
Probe
Rotometer
Output from Variable
Transformer
Audit
Tank
Cylinder
Strap
3/8" Swagelok
Variable
Transformer
Mounted in Case
110 VAC
Line Cord
Travel Case

Figure 1. Schematic Diagram of Audit Material Delivery System

3.3 ANALYSIS

Refer to the method specifications and procedures for the VOST method.

4.0 AUDIT MATERIAL (GAS CYLINDERS)

The audit material is supplied in gas cylinders. A maximum of 50 L of gas is to be used for each test run. A two-stage gas regulator is supplied for use with the gas cylinder.

5.0 PROCEDURES

5.1 SAMPLING

5.1.1 Preparation of VOST

All train components should be cleaned and assembled as described in the VOST method used.

5.1.2 Leak-Check Procedure

Before the sampling run, the train is leak-checked as described in the VOST method. During sampling, all connections should be visually examined.

5.1.3 Sample Generation

The gas sample from the audit cylinder is passed through the glass manifold at a flow rate of 2 L/min for 3 minutes to condition the glass system. A glass rotameter is supplied to measure the flow rate at the end of the glass manifold. The VOST probe then should be connected to one port of the glass manifold with 1/4 inch male/female joints and the probe should be purged with audit gas for an additional 2 minutes so that the probe is purged of ambient air before initiation of sample collection. This can be accomplished either by attaching a pump to a three-way stop-cock above the first condenser and drawing audit gas through the probe via the three-way stop-cock or by any other suitable method.

5.2 SAMPLE COLLECTION

After leak-checking and conditioning the glass probe, sample collection is accomplished by opening the valve at the inlet to the first condenser, turning on the pump and sampling at a rate of 0.5 L/min for 20 minutes. The sampling rate is measured with the rotameter which is part of the VOST. The volume of sample for any pair of the traps should not exceed 10 L. The temperature of the gas stream at the inlet to the first sorbent cartridge must be maintained at 20°C during sample collection.

After the collection of 10 L of sample, the train is leak-tested using the procedures described in the method used. If leak-test criteria as described in the method are not met, the samples should not be analyzed. If leak-test criteria are met, the train is returned to atmospheric pressure, the two sorbent cartridges are removed, the end caps are replaced, and analysis of cartridges is performed.

Repeat the sample collection procedure two more times with two new pairs of sample cartridges in the VOST, collect 10 L of sample each time, and perform the analysis.

5.3 SAMPLE ANALYSIS

Follow the procedures described in the method for sample analysis, calibration, and calculations. Report the amount of each constituent in the three samples and the blank values to the Project Officer and the audit supervisor for evaluation.

INSTUCTIONS FOR USE OF VOST AUDIT KIT

1. Attach the supplied tubing to the manifold according to the diagram shown in Figure 1. (See page 66.)

2. The manifold and rotometer should be secured to the support stand with the clamps provided in the kit. Most situations will require the manifold to be mounted vertically with the inlet at the bottom, and parallel to the rotometer. Allow the short 3/8" O.D. tubing to loop around to the bottom of the rotometer, without introducing any sharp kinks which may restrict the gas flow.

3. Gently pull the electrical cords from their compartment and connect according to the diagram on the reverse. The nominal length for the 110 VAC power cord is 8 feet and the nominal length for the output cord is 6 feet.

4. Temporarily remove the short 3/8" tubing from the outlet end of the manifold and insert the dial thermometer into the manifold. Adjust the variable transformer, which is mounted in the case, to heat the manifold to approximately 100°C. A setting of 50 on the scale should be sufficient to attain 100°C. After the manifold temperature has become stable, remove the thermometer and reattach the 3/8" tubing.

5. Adjust the regulator to start gas flow. The rotometer is downstream of the manifold and should be used to regulate the excess gas flow from the manifold. Approximate flow rates at COB are given below:

Gas Flow	Center of Ball
1.0 STD L/min	12.7
1.3	15.0
1.9	20.0
2.5	24.7
3.0	28.7
3.2	30.0
3.5	32.7

   The rotometer will present negligible back pressure to the manifold. ΔP for 5 L/min is 1 inch of water column.

6. After sampling is completed, allow the manifold to cool, disassemble and repackage the kit in the case. Gently push the power and output cords back into their compartment. Remove the knob from the regulator to facilitate packing in its' compartment.

APPENDIX C
PERMEATION TUBE RATE DATA

1. PERMEATION TUBES MAINTAINED AT 30°C

A. PERMEATION RATE DATA FOR METHYL ETHYL KETONE
B. PERMEATION RATE DATA FOR ACETONITRILE
C. PERMEATION RATE DATA FOR TRICHLOROETHYLENE
D. PERMEATION RATE DATA FOR 1,2-DICHLOROETHANE
E. PERMEATION RATE DATA FOR VINYL CHLORIDE
F. PERMEATION RATE DATA FOR BROMOMETHANE
G. PERMEATION RATE DATA FOR BENZENE
H. PERMEATION RATE DATA FOR CARBON TETRACHLORIDE
I. PERMEATION RATE DATA FOR 1,2-DIBROMOETHANE
J. PERMEATION RATE DATA FOR FREON 12 (WAFER-TYPE PERMEATION DEVICE)
K. PERMEATION RATE DATA FOR FREON 11
L. PERMEATION RATE DATA FOR CHLOROFORM
M. PERMEATION RATE DATA FOR 1,1,1-TRICHLOROETHANE
N. PERMEATION RATE DATA FOR PERCHLOROETHYLENE

2. PERMEATION TUBES MAINTAINED AT 50°C

O. PERMEATION RATE DATA FOR VINYL CHLORIDE
P. PERMEATION RATE DATA FOR BENZENE
Q. PERMEATION RATE DATA FOR CHLOROFORM
R. PERMEATION RATE DATA FOR CARBON TETRACHLORIDE
S. PERMEATION RATE DATA FOR PERCHLOROETHYLENE

A. PERMEATION RATE DATA FOR METHYL ETHYL KETONE

Date	Military Time	Mass in Grams	Time Interval (min.)	-----------Rate, ng/min.-----------	
				Calc.	Avg. of Last 3 ± Std. Dev.
3/21/84	1006	9.407179	0	---	----
4/06/84	1310	9.401605	23224	240	----
4/12/84	1644	9.399607	8854	226	----
5/15/84	1608	9.388331	47484	237	234 ± 7.7
5/25/84	1347	9.384971	14259	236	233 ± 6.4
7/03/84	1320	9.372270	56133	226	233 ± 6.0
8/14/84	1522	9.358500	60602	227	230 ± 5.2
10/04/84	1117	9.342162	73195	223	226 ± 2.1
11/11/84	1725	9.329975	55088	221	224 ± 3.1
12/28/84	1728	9.315429	67683	215	220 ± 4.3
2/22/85	1140	9.298565	80292	210	215 ± 4.6
4/11/85	1430	9.283756	69290	214	213 ± 2.1
6/24/85	1615	9.261100	64844	216	215 ± 4.0
8/18/85	1511	9.244282	79136	213	210 ± 3.9
9/19/85	1023	9.234687	45792	210	213 ± 2.7
10/18/85	0933	9.226245	41710	203	208 ± 4.3
12/17/85	0938	9.208522	86405	205	207 ± 2.9
2/21/86	0946	9.188738	95048	208	205 ± 2.4
5/30/86	0915	9.159552	141089	207	206 ± 1.2

B. PERMEATION RATE DATA FOR ACETONITRILE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min.	
				Calc.	Avg. of Last 3 ± Std. Dev.
3/21/84	1003	7.202254	0	---	----
4/06/84	1313	7.198543	23230	160	----
4/12/84	1647	7.197136	8854	159	----
5/15/84	1553	7.189600	47466	159	159 ± 0.5
5/25/84	1327	7.187370	14254	156	158 ± 1.4
8/14/84	1535	7.169260	116768	155	157 ± 1.9
10/04/84	1121	7.157775	73186	157	156 ± 1.0
11/11/84	1728	7.149302	55087	154	155 ± 1.6
12/28/84	1716	7.139032	67668	152	154 ± 2.6
2/22/85	1135	7.127004	80299	150	152 ± 1.6
4/11/85	1402	7.116492	69267	152	151 ± 0.9
5/10/85	1540	7.110357	41858	147	149 ± 2.1
6/24/85	1620	7.100157	64840	157	155 ± 4.4
8/18/85	1513	7.087929	79133	155	151 ± 4.6
9/19/85	1320	7.080876	45967	153	155 ± 1.6
10/18/85	1012	7.074815	41572	146	150 ± 3.9
12/17/85	0940	7.061806	86368	151	152 ± 3.2
2/21/86	1014	7.047403	95074	152	149 ± 2.5
5/30/86	0857	7.02607	141043	151	151 ± 0.4

C. PERMEATION RATE DATA FOR TRICHLOROETHYLENE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
3/21/84	1003	7.615336	0	---	----
4/06/84	1313	7.605070	23230	442	----
4/12/84	1647	7.601586	8854	393	----
5/15/84	1553	7.580562	47466	443	426 ± 28.3
7/03/84	1327	7.550092	70414	433	423 ± 26.1
8/14/84	1535	7.523522	60608	438	438 ± 5.1
10/04/84	1121	7.491442	73186	438	436 ± 3.3
11/11/84	1714	7.467495	55073	435	437 ± 2.0
12/28/84	1725	7.437981	67691	436	436 ± 1.8
2/22/85	1119	7.403042	80274	435	435 ± 0.5
4/15/85	1347	7.370239	75028	437	436 ± 0.8
5/10/85	1555	7.354876	36128	425	433 ± 5.2
6/24/85	1607	7.326343	64812	440	439 ± 6.5
8/18/85	1424	7.291176	79097	445	435 ± 8.3
9/19/85	1356	7.270900	46052	440	440 ± 2.1
10/18/85	0927	7.252623	41491	441	443 ± 2.0
12/17/85	0948	7.215422	86421	431	435 ± 4.7
2/21/86	1012	7.173927	95064	437	439 ± 4.1
5/30/86	0901	7.112015	141049	439	435 ± 3.6
8/14/86	0905	7.065018	109444	429	433 ± 4.0

D. PERMEATION RATE DATA FOR 1,2-DICHLOROETHANE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
3/21/84	1009	10.071488	0	---	----
4/06/84	1308	10.063885	23219	327	----
4/12/84	1542	10.061005	8794	327	----
5/15/84	1551	10.045316	47529	330	328 ± 1.5
7/03/84	1319	10.022900	70408	318	325 ± 6.2
8/14/84	1520	10.003421	60601	321	323 ± 6.1
10/04/84	1135	9.979827	73215	322	321 ± 2.0
11/11/84	1702	9.962440	55047	316	320 ± 3.5
12/28/84	1704	9.940788	67682	320	319 ± 3.2
2/22/85	1132	9.915571	80308	314	317 ± 2.5
4/11/85	1454	9.893581	69322	317	317 ± 2.4
5/10/85	1529	9.880462	41795	314	315 ± 1.5
6/24/85	1537	9.859942	64808	317	317 ± 1.4
8/18/85	1428	9.834282	79131	324	319 ± 4.4
9/19/85	1101	9.819500	45873	322	320 ± 3.2
10/18/85	0920	9.806341	41659	316	320 ± 3.6
12/17/85	0926	9.779398	86406	312	317 ± 4.3
2/21/86	0952	9.749213	95066	316	317 ± 2.4
5/30/86	0912	9.704355	141080	318	315 ± 2.8
8/14/86	0858	9.669791	109426	316	317 ± 0.9

E. PERMEATION RATE DATA FOR VINYL CHLORIDE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
4/13/84	1655	5.358506	0	---	----
4/26/84	0916	5.347064	18261	627	----
5/15/84	1601	5.329644	27765	627	----
7/03/84	1323	5.284878	70402	636	630 ± 5.1
8/14/84	1527	5.246041	60604	641	635 ± 6.8
9/03/84	1232	5.227665	28625	642	640 ± 3.2
9/16/84	1636	5.215302	18964	652	645 ± 6.1
10/04/84	1115	5.199146	25599	631	642 ± 10.4
11/11/84	1707	5.164174	55072	635	639 ± 11.1
12/28/84	1707	5.121084	67680	637	634 ± 2.9
2/5/85	1636	5.085825	56129	628	633 ± 3.7

F. PERMEATION RATE DATA FOR BROMOMETHANE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
6/24/85	1548	2.991727	---	---	----
8/18/85	1446	2.965721	79138	329	----
9/19/85	1350	2.950697	46024	326	----
10/18/85	1000	2.937179	41530	326	327 ± 1.3
12/17/85	1005	2.909900	86405	316	323 ± 4.9
2/21/86	1015	2.878832	95050	327	323 ± 4.9
5/30/86	0846	2.832835	141031	326	323 ± 5.1
8/14/86	0901	2.797575	109455	322	325 ± 2.1

G. PERMEATION RATE DATA FOR BENZENE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
9/26/83	1053	10.112975	-----	---	----
10/04/83	1120	10.108570	11547	381	----
10/19/83	1630	10.099715	21910	404	----
11/11/83	1410	10.086777	32980	392	393 ± 11.3
11/28/83	1245	10.077150	24395	395	397 ± 6.3
12/08/83	1605	10.071084	14600	415	401 ± 12.8
12/12/83	1322	10.069308	5597	317	376 ± 51.7
1/11/84	1553	10.052030	43351	399	377 ± 52.5
1/25/84	0958	10.044355	19805	388	368 ± 44.1
2/22/84	0948	10.028590	40310	391	392 ± 5.6
3/21/84	1052	10.012661	40384	394	391 ± 3.5
4/12/84	0920	10.000166	31588	396	394 ± 2.3
5/15/84	1645	9.981283	47965	394	395 ± 0.9
7/03/84	1348	9.953691	70383	392	394 ± 1.8
8/14/84	1512	9.929800	60564	394	393 ± 1.2
9/03/84	1227	9.918611	28635	391	392 ± 1.9
10/04/84	1255	9.901032	44668	394	393 ± 1.9
11/11/84	1653	9.879547	54958	391	392 ± 1.6
12/28/84	1701	9.853070	67688	391	392 ± 1.4
2/05/85	1646	9.831206	56145	389	391 ± 0.8
4/11/85	1339	9.794760	93413	390	390 ± 0.7

(Continued)

G. PERMEATION RATE DATA FOR BENZENE (Continued)

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
5/10/85	1520	9.778600	41861	386	389 ± 1.8
6/24/85	1459	9.753051	64779	394	390 ± 3.4
8/18/85	1353	9.721636	79134	397	393 ± 4.7
9/19/85	0915	9.703656	45802	393	395 ± 1.8
10/18/85	0853	9.687084	41738	397	396 ± 2.1
12/17/85	0839	9.654268	86386	380	390 ± 7.3
2/21/86	0929	9.617055	95090	391	389 ± 7.1
5/29/86	1546	9.562210	140057	392	388 ± 5.5
8/14/86	0910	9.519301	110484	388	390 ± 1.5

H. PERMEATION RATE DATA FOR CARBON TETRACHLORIDE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
9/08/83	1028	11.782350	-----	---	----
9/15/83	0905	11.779715	9997	264	----
9/23/83	0918	11.776830	11533	250	----
10/03/83	1655	11.772735	14857	276	263 ± 12.7
10/19/83	1630	11.766260	23015	281	269 ± 16.6
12/12/83	1315	11.745652	77565	266	274 ± 7.9
1/11/84	1517	11.733950	43322	270	272 ± 8.1
2/22/84	0935	11.717890	60138	267	268 ± 2.3
4/12/84	1616	11.698815	72401	263	267 ± 3.3
5/15/84	1643	11.685944	47547	271	267 ± 3.6
7/03/84	1344	11.667252	70381	266	267 ± 3.7
8/14/84	1501	11.651021	60557	268	268 ± 2.6
9/03/84	1221	11.643461	28640	264	266 ± 2.0
10/04/84	1236	11.631450	44655	269	267 ± 2.7
11/11/84	1649	11.616827	54973	266	266 ± 2.5
12/28/84	1653	11.598952	67684	264	266 ± 2.5
2/05/85	1633	11.584444	56140	258	263 ± 3.2
4/11/85	1549	11.559467	93556	267	263 ± 3.6
5/10/85	1528	11.548491	41739	263	263 ± 3.5
6/24/85	1456	11.531157	64768	268	266 ± 2.1
8/18/85	1356	11.509692	79140	271	267 ± 3.4

(Continued)

H. PERMEATION RATE DATA FOR CARBON TETRACHLORIDE (Continued)

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
9/19/85	0918	11.497475	45802	267	269 ± 1.9
10/18/75	0900	11.486092	41742	273	270 ± 2.5
12/17/85	0905	11.463745	86405	259	266 ± 5.8
2/21/86	0931	11.438465	95066	266	266 ± 5.7
5/29/86	1549	11.401090	140058	267	264 ± 3.7
8/14/86	0912	11.371735	110483	266	266 ± 0.5

I. PERMEATION RATE DATA FOR 1,2-DIBROMOETHANE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min.	
				Calc.	Avg. of Last 3 ± Std. Dev.
11/11/84	1643	26.254100	0	---	----
12/02/84	1505	26.238300	30142	524	----
12/28/84	1643	26.213700	37538	655	----
2/22/85	1112	26.167800	80309	572	584 ± 54.2
4/11/85	1350	26.128200	69278	572	599 ± 39.5
5/10/85	1446	26.103700	41816	586	476 ± 6.8
6/24/85	1431	26.066500	64785	574	573 ± 6.2
8/18/85	1419	26.020300	79188	583	585 ± 5.0
9/19/85	0930	25.993600	45791	583	580 ± 4.3
10/18/85	0911	25.970300	41741	559	575 ± 11.2
2/21/86	0920	25.868400	181449	562	568 ± 10.7
5/29/86	1533	25.788800	140053	568	563 ± 3.8
8/14/86	0925	25.726900	110512	560	563 ± 3.6

J. PERMEATION RATE DATA FOR FREON 12 (WAFER-TYPE PERMEATION DEVICE)

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
8/16/84	1445	20.584800	0	---	----
8/22/84	1608	20.579600	8723	596	----
9/03/84	1240	20.570400	17072	539	----
10/04/84	1126	20.546700	44566	532	556 ± 35.3
11/11/84	1658	20.515700	55052	563	545 ± 16.4
12/28/84	1711	20.4782[illegible]	67693	554	550 ± 16.1
2/22/85	1116	20.4342[illegible]	80285	548	555 ± 6.2
4/11/85	0411	20.395600	68695	562	555 ± 5.7
5/10/85	1557	20.374100	42466	505	539 ± 23.6
6/24/85	1422	20.338700	64705	[illegible]47	555 ± 23.5
8/18/85	1431	20.295200	79209	549	528 ± 19.8
9/19/85	1137	20.269240	45906	566	556 ± 8.2
10/18/85	1017	20.246870	41680	537	543 ± 11.8
2/21/86	1020	20.147850	181443	546	556 ± 12.0
5/30/86	0835	20.069450	141015	556	546 ± 7.9
8/14/86	0838	20.011510	109443	529	538 ± 10.9

K. PERMEATION RATE DATA FOR FREON 11

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min.	
				Calc.	Avg. of Last 3 ± Std. Dev.
8/14/84	1456	4.258547	0	---	----
8/22/84	1601	4.252418	11585	529	----
10/04/84	1130	4.220167	61649	523	----
11/11/84	1709	4.191590	55059	519	524 ± 5.0
12/28/84	1719	4.156605	67690	517	520 ± 3.2
2/22/85	1124	4.115066	80285	517	518 ± 0.9
4/11/85	1552	4.079076	69388	519	518 ± 0.8
5/10/85	1555	4.057745	41763	511	516 ± 3.5
6/24/85	1545	4.024100	64790	519	519 ± 3.9
8/18/85	1426	3.983036	79121	519	515 ± 4.0
9/19/85	1018	3.959239	45832	519	519 ± 0.1
10/18/85	0930	3.937718	41712	516	518 ± 1.5
12/17/85	0929	3.894612	86399	499	509 ± 8.9
2/21/86	0950	3.845807	95061	513	515 ± 7.5
5/30/86	0840	3.773275	141050	514	507 ± 7.0
8/14/86	0850	3.717801	109450	507	510 ± 3.3

L. PERMEATION RATE DATA FOR CHLOROFORM

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min.	
				Calc.	Avg. of Last 3 ± Std. Dev.
9/08/83	1028	12.144390	-----	---	----
9/15/83	0900	12.142700	9992	169	----
9/23/83	0915	12.140650	11535	178	----
10/03/83	1654	12.137910	14859	184	177 ± 7.7
10/19/83	1630	12.133370	23016	197	186 ± 9.9
12/12/83	1340	12.119373	77590	180	187 ± 8.8
1/11/84	1525	12.111021	43305	193	190 ± 8.7
2/22/84	0939	12.100180	60134	180	185 ± 7.2
3/21/84	0939	12.092851	40320	182	185 ± 6.9
4/12/84	1614	12.086928	32075	185	182 ± 2.2
5/15/84	1638	12.078136	47544	185	184 ± 1.7
7/03/84	1345	12.065269	70387	183	184 ± 1.2
8/14/84	1504	12.054074	60559	185	184 ± 1.2
9/03/84	1216	12.048717	28632	187	185 ± 2.1
10/04/84	1239	12.040517	44663	184	185 ± 1.8
11/11/84	1647	12.030424	54968	184	185 ± 2.0
12/28/84	1650	12.018009	67683	183	184 ± 0.1
2/05/85	1635	12.007974	56145	179	182 ± 2.3
4/11/85	1547	11.990758	93552	184	182 ± 2.4
5/10/85	1523	11.983266	41736	180	181 ± 2.3
6/24/85	1524	11.971421	64801	183	182 ± 1.9

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L. PERMEATION RATE DATA FOR CHLOROFORM (Continued)

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min.	
				Calc.	Avg. of Last 3 ± Std. Dev.
8/18/85	1358	11.956646	79114	187	183 ± 3.0
9/19/85	0909	11.948155	45791	185	185 ± 1.6
10/18/85	0903	11.940477	41754	184	185 ± 1.2
12/17/85	0900	11.925118	86397	178	182 ± 3.3
2/21/86	0933	11.907837	95073	182	181 ± 2.5
5/29/86	1543	11.882016	140050	184	181 ± 2.7
8/14/86	0907	11.861710	110484	184	183 ± 1.1

M. PERMEATION RATE DATA FOR 1,1,1-TRICHLOROETHANE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
11/11/84	1638	21.256900	0	---	----
12/02/84	1502	21.249200	30144	255	----
12/28/84	1640	21.238300	37538	290	----
2/22/85	1109	21.219100	80309	239	262 ± 21.4
4/11/85	1348	21.202300	69279	242	257 ± 23.4
5/10/85	1515	21.190000	41847	294	259 ± 25.1
6/24/85	1429	21.173900	64754	249	246 ± 22.9
8/18/85	1417	21.152900	79188	265	280 ± 18.7
9/19/85	0927	21.140200	45790	277	264 ± 11.8
10/18/85	0915	21.129750	41748	250	264 ± 11.1
2/21/86	0918	21.083050	181443	257	262 ± 11.5
5/30/86	1536	21.047040	141498	255	254 ± 2.9
8/14/86	0923	21.018550	109067	261	258 ± 2.8

N. PERMEATION RATE DATA FOR PERCHLOROETHYLENE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min.	
				Calc.	Avg. of Last 3 ± Std. Dev.
8/30/83	1544	7.175680	---	---	----
9/08/83	1621	7.169790	12997	453	----
9/15/83	0840	7.165320	9619	465	----
9/26/83	1032	7.158045	15952	456	458 ± 6.0
10/03/83	1650	7.153450	10458	439	453 ± 12.9
10/05/83	1336	7.152400	2686	391	429 ± 33.8
12/12/83	1345	7.108874	97929	444	425 ± 29.6
1/11/84	1521	7.089595	43296	445	427 ± 31.2
2/27/84	1617	7.059930	67736	438	443 ± 4.0
3/21/84	1032	7.045630	32775	436	440 ± 4.8
4/12/84	1625	7.031466	32033	442	439 ± 3.0
5/15/84	1648	7.010514	47543	441	440 ± 3.0
7/03/84	1349	6.979667	70381	438	440 ± 2.0
8/14/84	1517	6.952837	60568	443	441 ± 2.3
9/03/84	1212	6.940168	28615	443	441 ± 2.6
10/04/84	1250	6.920525	44678	440	442 ± 1.9
11/11/84	1704	6.896424	54974	438	440 ± 2.2
12/28/84	1714	6.866720	67690	439	439 ± 0.6
2/05/85	1642	6.842695	56128	428	435 ± 5.0
4/11/85	1553	6.801284	93551	443	437 ± 6.2
5/10/85	1542	6.783276	41749	431	434 ± 6.3

(Continued)

N. PERMEATION RATE DATA FOR PERCHLOROETHYLENE (Continued)

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
6/24/85	1527	6.754380	64785	446	440 ± 6.3
8/18/85	1500	6.718923	79173	448	442 ± 7.4
9/19/85	0858	6.698666	45718	443	446 ± 2.0
10/18/85	0924	6.680084	41786	445	445 ± 2.0
12/17/85	0923	6.642860	86399	431	440 ± 6.2
2/21/86	1003	6.600940	95080	441	439 ± 5.8
5/29/86	1558	6.539037	140035	442	438 ± 5.0
8/14/86	0855	6.490665	110457	438	440 ± 1.7

O. PERMEATION RATE DATA FOR VINYL CHLORIDE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
4/22/86	0924	8.522800	---	---	----
4/25/86	0852	8.514400	4288	1959	----
4/28/86	1630	8.505850	4778	1790	----
5/01/86	1318	8.497030	4128	2137	1962 ± 142
5/06/86	1047	8.484680	7049	1752	1893 ± 173
5/12/86	1315	8.469600	8788	1716	1868 ± 190
5/16/86	1108	8.460780	5633	1566	1678 ± 81
5/23/86	1105	8.444180	10077	1647	1643 ± 61

P. PERMEATION RATE DATA FOR BENZENE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
4/22/86	0930	11.316000	---	---	----
4/25/86	0858	11.306575	4288	2198	----
4/28/86	1639	11.296094	4781	2192	----
5/01/86	1325	11.287029	4126	2197	2196 ± 2.5
5/06/86	1055	11.271494	7050	2204	2198 ± 4.6
5/12/86	1319	11.252760	8784	2133	2178 ± 32.0
5/16/86	1056	11.240942	5617	2104	2147 ± 41.8
5/23/86	1110	11.221344	10094	1942	2059 ± 84.2

Q. PERMEATION RATE DATA FOR CHLOROFORM

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
4/22/86	0934	10.272800	---	---	----
4/25/86	0901	10.255625	4287	4006	----
4/28/86	1642	10.236192	4781	4065	----
5/01/86	1328	10.219168	4126	4126	4066 ± 48.9
5/06/86	1057	10.191173	7049	3972	4054 ± 63.5
5/12/86	1322	10.156977	8785	3893	3997 ± 97.0
5/16/86	1053	10.135680	5611	3796	3887 ± 71.9
5/23/86	1113	10.100412	10100	3492	3727 ± 171

R. PERMEATION RATE DATA FOR CARBON TETRACHLORIDE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min.	
				Calc.	Avg. of Last 3 ± Std. Dev.
4/22/86	0924	22.764800	---	---	----
4/25/86	0855	22.749100	4291	3659	----
4/28/86	1634	22.727550	4779	4509	----
5/01/86	1321	22.711390	4127	3916	4028 ± 356
5/06/86	1050	22.682470	7049	4103	4176 ± 248
5/12/86	1316	22.647560	8786	3973	3997 ± 78.2
5/16/86	1107	22.626950	5631	3660	3912 ± 186
5/23/86	1108	22.589160	10081	3749	3794 ± 132

S. PERMEATION RATE DATA FOR PERCHLOROETHYLENE

Date	Military Time	Mass in Grams	Time Interval (min.)	Rate, ng/min. Calc.	Rate, ng/min. Avg. of Last 3 ± Std. Dev.
4/22/86	0924	8.522800	---	---	----
4/25/86	0852	8.514400	4288	1959	----
4/28/86	1630	8.505850	4778	1790	----
5/01/86	1318	8.497030	4128	2137	1962 ± 142
5/06/86	1047	8.484680	7049	1752	1893 ± 173
5/12/86	1315	8.469600	8788	1716	1868 ± 190
5/16/86	1108	8.460780	5633	1566	1678 ± 80.7
5/23/86	1105	8.444180	10077	1647	1643 ± 61.4